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ORIGINAL ARTICLES.

WOUND-INFECTION WITH THE BACILLUS ÆROGENES CAPSULATUS.[1]

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WITH DISCUSSION,
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AND BACTERIOLOGIC REPORT,
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ALTHOUGH the subject of the bacillus ærogenes capsulatus belongs to the field of the bacteriologist, the infection by the bacillus is so powerful and rapid as to present a clinical picture to the surgeon well worthy of study.

During the year 1891 Dr. Wm. Welch of Baltimore wrote an article describing the organism and its methods of cultivation. In the *Journal of Experimental Medicine*, January, 1896, a paper was published, to be concluded at a later date, by Drs. Welch and Simon Flexner, entitled "Observations Concerning the Bacillus Ærogenes Capsulatus," in which a series of twenty-three personal observations by these gentlemen is reported. In each of these cases but a brief history is given, with a view of demonstrating the presence, *ante-* or *post-mortem* of this bacillus, and from this article I shall make free collations from the group of strictly surgical cases presented.

It is said that this bacillus is, or may be, conveyed through the soil, and, from an analysis of all cases reported in which an examination of the intestinal contents has been made, I am inclined to believe its chief habitat in man is the intestinal tract, from whence it is conveyed by the lymphatics and blood to various regions of the body. It will be noted that in several of the surgical cases the infection was particularly marked in cases involving the anoperineal region, several of these being genito-urinary cases, and in addition to these I have had access to the proof of an article, by Dr. E. K. Dunham of this city, published in the *Johns Hopkins Hospital Bulletin* for April, 1897, containing the histories of five cases, the second of which is the one reported by myself, and also one case, unpublished, occurring in the service of Dr. Bryant, at St. Vincent's Hospital, of this city.

For a long time, and even at present, cases of infection by the bacillus ærogenes capsulatus were called malignant edema, air-embolism, emphysematous gangrene, etc., but since the study of this bacillus by Drs. Welch, Flexner, and Dunham we know that the cases are entirely different, at least in the causation, although decidedly similar in their clinical appearance. This confusion is due to the development of a type of gangrene and marked emphysema in most cases, with delirium and fever allied to the cases of malignant edema. On autopsy in cases of infection with this bacillus we have the "Schaum-organe" (so-called by the Germans) as a result of the development of areas of gas in various viscera which gives the peculiar foam or "schaum" appearance to these structures.

The infection may be pure or mixed. By analysis of the reported cases of Welch, Flexner, and Dunham, it will be seen that there were two cases of pure infection, with two deaths, and fourteen cases of mixed infection, with ten deaths, although one of these was probably due to tetanus; that the organisms most frequently found were the bacillus coli communis and the streptococcus pyogenes, and that in several patients who recovered the streptococci were found. From these results it is readily seen that all recoveries were instances of mixed infection, and also that patients with mixed infection in whom the disease terminated fatally lived longer than those in whom there was a pure infection. This fact would incline us to consider cases of mixed infection as being by far the more favorable. In a case of pure infection (Frankel) there was no pus, but a turbid, brownish fluid, and a grayish, macerated condition of the underlying muscles were found. This condition was found in the case reported by myself in the article mentioned, while in cases of mixed infection pus is usually found. In a number of the cases reported the bacillus was observed only on *post-mortem* examination, due to the fact that cultures were not taken during life. This naturally causes our statistics to lose a certain degree of interest, but, at the same time, in cases of infection of unbroken surfaces it can only be reasoned that the bacillus must have been present during life, but developed after death, as it is proven that this germ multiplies rapidly in the dead. The infection, as be-

[1] Read before the Surgical Section of the New York Academy of Medicine, May 10, 1897.

fore stated, may be conveyed by means of the blood, or by instruments, as in one case reported by Dr. Dunham, following catheterization by the patient himself. Two cases reported by Frankel, contained in the article by Welch and Flexner, were due to hypodermic injections, one of morphin and the other of camphor oil. One case reported by Halsted was due to an infected bullet.

In but one case out of twelve reported by Welch and Flexner a chill is reported as the first symptom.

As a rule, delirium, rapid pulse, high temperature (101° to 105.5° F.), with emphysema and discoloration of the diseased area, or marked abdominal distension when the peritoneal cavity is involved, are the main symptoms, the emphysema and discoloration being very rapid. Upon incising the emphysematous tissues the escaping gas, when light is applied, will burn with a blue flame. The duration of the disease after evidences of infection varies from four to forty-eight hours in the pure and from forty-eight hours to ten days in the mixed type. The sudden delirium and general condition of stupor or somnolence seem to be due to a toxemia rather than to blood-involvement by the organism.

The importance of an early diagnosis in these cases is of inestimable value, as amputation, when possible, or liberal incisions with free drainage in cases of pure infection, is the only rational treatment; while in cases of mixed infection, the evidences not being so acute, evidently held in abeyance by the mixture of bacilli and cocci, free incisions for drainage, followed later by amputation if the disease is rapidly progressing, is indicated.

The history of my case is as follows:

L. M., seven years old, fell from the fourth floor of a house to the ground, on September 19, 1896, at about 3 P.M., and sustained a compound fracture of the right humerus at about its middle, and also a small scalp wound. He was seen about two hours later, and in addition to the above injuries was found unconscious. The arm was very dirty and grimy. Considerable contusion of the right shoulder was sustained. Every antiseptic and aseptic precaution was taken, and the patient was put to bed in very poor condition. At 8 P.M. his temperature was 100°F., pulse 130 and respirations 44. The extremities were cold. On September 20th the temperature throughout the day was from 101° to 101.6° F., pulse 130 to 140, and respirations 30 to 42. The patient was unconscious. September 21st, 9 A.M., temperature 101.6° F., pulse 150, respirations 42; 2 P.M., forty-seven hours after the injury, temperature 104.4° F., pulse 144, respirations 44.

Apparently the increase in temperature and pulse was the first evidence of the infection. The dressings were removed, and the arm and pectoral region of the right side were found tense, of a greenish-bronze color, and, upon incising, a peculiar brownish fluid with slight odor escaped. The muscles of the arm were thoroughly macerated. As the process had extended to the chest, amputation was deemed inadvisable, but free drainage was made with incisions, and bichlorid of mercury dressings were applied. At 9 P.M. his temperature was 105.4° F., pulse 166, and respirations 32. September 22d, 3 A.M., temperature 104.6° F., pulse 170, respirations 40. The arm was again dressed. Edema had extended to the right half of the chest and shoulder and down the forearm. There was at this time some emphysema present. The patient died at 3 P.M., three days after the injury and one day after the first marked evidences of this infection. Thinking the case to be one of malignant edema, a culture was taken before death, but after the second dressings had been removed.

In addition to this case, I will briefly summarize those published in the articles of Welch, Flexner, and Dunham having a distinct surgical aspect, and comment upon the cases of infection with medical bearing. There were ten observations by the first-named observers upon general surgical cases occurring in the services of Drs. Halsted, Tiffany, Kelly, and Mann, which I have arranged in the accompanying table, to which I add the five cases, including my own, reported by Dr. Dunham, and the case already mentioned, for which I am indebted to Dr. J. D. Bryant of New York.

It will be observed that the best results followed in cases in which amputation was performed, and that in all cases of recovery the infection was of the mixed variety. The organism most frequently found in the cases of mixed infection was the streptococcus, and in six of the tabulated cases—Nos. III., XII., XVII., and XVIII, by Welch and Flexner, and Nos. IV. and V., by Dunham—the colon bacillus was found. In addition to these tabulated cases there are four cases of Frankel's (reported by Welch and Flexner), one of pure infection and three of mixed, three patients recorded as dying, while the result in the fourth case (of mixed infection) was not stated.

In looking over the medical cases reported by Welch and Flexner we find the bacillus present in the peritoneal cavity in the following: No. VIII., cancer of the duodenum, with perforation. No. X., typhoid, with perforations. No. XI., typhoid, with perforations. No. XIII., diabetes mellitus and cirrhosis of the liver. No. XIV., arteriosclerosis, chronic diffuse nephritis, etc. In Cases No. XV. (acute endocarditis and chronic Bright's disease) and XVI. (thoracic aneurism and pulmonary infarctions) the bacillus was found in the infarcted areas and in the pleura, and in these two cases the authors question the possible infection from the lungs or conveyance from the intestine.

From the above observations we deduce the following:

1. That, from the frequency of the presence of this bacillus in the peritoneal cavity, and also its frequent association with the colon bacillus, we are justified in believing its habitat in man to be the intestinal tract.

2. That the infection may be conveyed by means of the blood from its habitat or introduced from without, probably from the soil.

3. That, while in pure infections the progress is extremely rapid and decidedly grave, in mixed infection it is protracted and the prognosis is not so grave.

4. That the use of an antitoxic serum, or the infecting of cases of pure infection with the streptococcus, would at present seem justifiable.

5. That liberal incisions, with drainage, or early amputation, is demanded in all cases of infection with the bacillus ærogenes capsulatus.

Since writing this paper Dr. Halsted's open-bath method of treating cases of sepsis and cases of infection with this bacillus has come to the attention of the author, and, after seeing the experiments of Dr.

CASES REPORTED BY DRS. WELCH AND FLEXNER.

	Case of Dr.	Sex.	Injury.	Operation.	Result.	Pure.	Infection Mixed with	Bacilli Found	
								Ante-mortem.	*Post-mortem.*
	Halsted.	M.	Gun-shot of knee.	Amputation of thigh.	Recovered.	No.	Staphylococcus aureus and staphylococcus pyogenes.	Yes.	.....
II.	Halsted.	M.	Compound fracture of leg.	Amputation of thigh.	Recovered.	No.	Staphylococcus albus.	Yes.	.....
III.	Halsted.	M.	Injury of hip and wound of rectum.	Extensive incisions.	Died.	No.	Intestinal (?) bacilli and streptococci.	Yes.	.....
IV.	Tiffany.	M.	Compound comminuted fracture of patella.	Incisions.	Died.	Yes.	.....	Not stated.	Not stated.
V.	Tiffany.	M.	Compound comminuted fracture of forearm.	Amputation of arm.	Recovered.	No.	Pyogenic cocci.	Yes.	Yes.
VI.	Mann.	F.	Gangrene (?) of hand and forearm.	Amputation of arm.	Recovered.	No.	Streptococci.	.....	From the amputated arm.
VII.	Halsted.	F.	Phlegmon of hand and forearm.	Amputation.	Died.	No.	Streptococci and staphylococci.	None found before death.	Twenty-four hours after death.
XVII.	Halsted.	M.	Catheterization for retention of urine, stricture, sepsis.	.....	Died.	No.	Colon and streptococci.	Not examined.	Three-quarters of an hour after death.
XVIII.	Halsted.	M.	Catheterization for enlarged prostate, retention.	.....	Died.	No.	Colon and pyogenic.	Not examined.	Yes.
XII.	Kelly.	F.	Strangulated umbilical hernia.	Operation.	Died.	No.	Colon and pyogenic.	Not examined.	Yes.

CASES REPORTED BY DR. E. K. DUNHAM.

	Case of Dr.	Sex.	Injury.	Operation.	Result.	Pure.	Infection Mixed with	Bacilli Found.	
								Ante-mortem.	*Post-mortem.*
I.	Dennis.	F.	Cellular infection about the lower jaw.	Incision.	Died.	No.	Pyogenic cocci.	Yes.	Yes.
II.	Erdmann.	M.	Scalp wound, compound fracture of right arm.	Free incision.	Died.	No.	Pyogenic cocci.	Yes.	Not examined.
III.	Gouley.	M.	External urethrotomy primarily, passage of sterile sound secondarily.	.....	Died.	Yes.	.....	Yes.	Yes.
IV.	Hotchkiss.	M.	External urethrotomy primarily, passage of sterile sound secondarily	.....	Died.	No.	Coli communis (?)	Yes.	Yes.
V.	Abbe.	M.	Prostatic hypertrophy, catheterization.	Incision.	Died.	No.	Coli communis and streptococci.	Yes.	Not stated.
I.	Bryant.[1]	M.	Compound fracture of leg.	Incision, amputation.	Died.	No.	Streptococci and staphylococci.	Yes.	.....

[1] Unpublished.

Total, 16 cases; 12 males, 4 females. Died, 12; recovered, 4. Pure, 2. Infection mixed in 14; 6 with colon bacilli.

E. K. Dunham and hearing his discussion of this paper, the author advocates most heartily the open-bath treatment, as far as possible, in these cases.

DISCUSSION BY DR. EDWARD K. DUNHAM.

Infection with the bacillus ærogenes capsulatus (Welch) differs from the infections with the ordinary pyogenic cocci in that the bacillus is a strict anaërobe; *i.e.*, is incapable of growing in the presence of free oxygen. It appears to me that advantage might be taken of this fact in contriving an appropriate treatment for cases of infection by this bacillus. If we can so arrange matters that the bacilli within the tissues are exposed to a sufficient amount of oxygen, we shall be able to check their growth and arrest the progress of the destruction they occasion.[1]

In devising a mode of treatment with this end in view, the question of how much oxygen must be present to stop the development of the bacillus is of prime importance. I have endeavored to approach this question by means of the following experiment, suggested by the procedure followed by Dr. Halsted of the Johns Hopkins Hospital in his treatment of cases of severe infection with full and continuous hot baths:

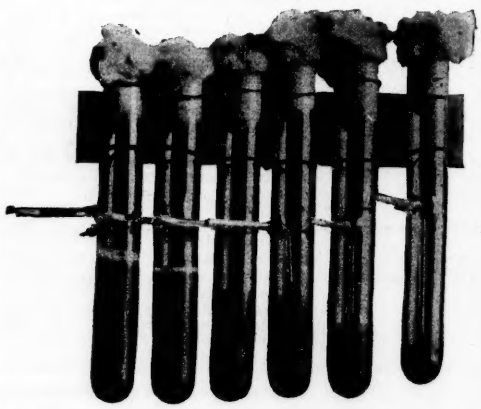
A series of six test-tubes, provided with a small inner tube entering at the side and extending nearly to the bottom, was filled to various heights with nutrient bouillon and then sterilized by moist heat. Into each tube a number of short threads containing spores of the bacillus ærogenes capsulatus were then introduced, and hydrogen was passed through the bouillon, by means of the small inner tube, for half an hour. The object of this was to displace the oxygen in the bouillon. The tubes were then placed in an incubator kept at 35° C. The depth of bouillon in the tubes was 3, 2¾, 2¼, 2, 1½, and ¾ inches respectively.

After the expiration of fifteen hours the tubes were taken from the incubator and examined. An abundant growth was found in the two tubes containing the most bouillon, the latter being very cloudy throughout. There was a moderate sediment of bacilli in the bottom of these tubes, and minute bubbles of gas could be seen rising through the bouillon and collecting in foam on its surface. The other four tubes, containing less bouillon, appeared clear. (See Fig. 1.)

I inferred from these results that the bouillon at the bottom of the two tubes containing the most broth remained sufficiently free from oxygen, after the flow of hydrogen had been stopped, for the spores which were present to develop into bacilli and for the latter to grow with a luxuriance ample enough to maintain anaërobic conditions in the bouillon by the production of the gas generated by the bacillus itself. This gas we know to consist chiefly of hydrogen and carbon dioxid (hydrogen, sixty-four per cent.; carbon dioxid, twenty-eight per cent.), so that its constant evolution within the culture-medium would be equivalent to the continuous passage of a moderate amount of those gases through the broth. In the case before us this evidently sufficed to maintain anaërobic conditions within the tubes containing the largest amount of bouillon.

In the tubes which appeared to be clear the absorption of atmospheric oxygen by the bouillon had extended sufficiently deep and had been abundant enough to check the development of the spores at the bottoms of the tubes. In the two middle tubes of the series a very slight clouding of the bouillon in the small inner tube could be detected. It appeared, then, that the penetration of the oxygen into this inner tube was more tardy than its penetration through the surrounding broth. This may have been due to the tightness of the cotton plugs in the outer ends of the small tubes, for it was noticed that a considerable pressure was necessary in order to force the hydrogen through those plugs when the cultures were being prepared.

FIG. 1.



Test-tubes containing different quantities of bouillon, showing extent of growth of the bacillus ærogenes capsulatus.

If we assume that the rate at which water will take up oxygen from the air is the same as the rate at which bouillon will absorb it, it appears to me that the results of this simple experiment throw some light upon the efficacy of the full-bath treatment of cases of infection by this bacillus. If incisions into the infected parts can be made free enough to expose the tissues containing the bacillus to the close

[1] The mere presence of oxygen does not *kill* the bacillus, but it prevents its growth, and therefore the advance of the infectious process, allowing time for further measures tending to the destruction of the bacterium to be put into practice.

action of water, the oxygen which the latter contains may be sufficient to check the growth of the bacillus.

There is one factor which is left out of consideration in this experiment, namely: the influence which might be exerted by the tissues to impede the passage of oxygen from water surrounding the tissues to the bacilli which they contain.

In order to gain some information on this point, I made the following experiment: About 5 c.cm. of a twenty-four-hour bouillon culture of the bacillus was injected into a vein of a rabbit, and, after a few minutes, the animal was killed. The liver was at once removed and pieces of it placed in dishes containing recently boiled water. These dishes, with their contents, were placed in an incubator. The fragments of liver must have contained many bacilli disseminated throughout their substance by the blood circulating in the hepatic capillaries during the life of the animal. The water in which the pieces of liver were immersed had been deprived of at least a large proportion of the oxygen it had contained in solution by the boiling, but its surface was freely exposed to the atmosphere. The least measurement of the pieces of liver ranged between one-half and one centimeter, and they were covered by from one to two centimeters of water.

After seven hours all the pieces of liver were crowded with small bubbles of gas, which so diminished their specific gravities that they floated upon the water with an immersion of only about two-thirds of their bulk. They were surrounded by a coarse foam, due to gas which had escaped from them and become imprisoned in the albuminous fluid resulting from the maceration of the tissues.

This experiment shows that the bits of tissue sufficiently impeded the passage of oxygen from the air and water to the bacilli to enable the latter to develop and evolve enough gas to maintain anaërobic conditions suited to their further and rapid multiplication.

Thinking that the deoxygenation of the water in which the pieces of liver were immersed in the last experiment might be the cause of the unfavorable results, I repeated the experiment, using water containing five and ten per cent. of peroxid of hydrogen in the place of boiled water. The results of this experiment were almost identical with those of the preceding one. At the end of eight hours all the pieces of liver were floating on the surface of the liquid in the dishes, and contained bubbles of gas readily discernible through the peritoneal covering.

In the first experiment, made with bouillon, the bacilli were placed under the least advantageous conditions for their development, for they were directly exposed to the action of whatever oxygen might be present in the bouillon. In the other two sets of experiments the conditions were most favorable for the development of the bacillus, for not only were they protected from access of oxygen by a layer of tissue, but the tissue in which they were situated contained sugar, which we know would favor the production of abundant gas and so facilitate the continuance of anaërobic conditions.

In order to eliminate this last condition, I asked my friend Dr. Le Boutillier to repeat the last set of experiments, using bits of kidney instead of liver. His results were as follows: The pieces of kidney measured from ½ to about 1½ centimeters in their least diameters. They were placed in dishes containing 1¼- and 2½-per-cent. aqueous solutions of peroxid of hydrogen, and were kept in an incubator for twenty-one hours. At the end of that time the pieces of tissue were removed from the dishes and placed in a five-per-cent. solution of formaldehyde. Sections made through the centers of these bits of kidney after they had been hardened failed to reveal the presence of spaces that would have demonstrated the production of gas in the tissues before they were hardened. That the bacilli were present in the tissues was shown on staining the sections, when a considerable number of bacilli could be seen in the renal capillaries. The bacilli were so scattered that it appeared highly improbable that they had multiplied.

FIG. 2.

Section of liver infected by the bacillus ærogenes capsulatus, showing large spaces filled with gas as a result of the infection, and groups of bacilli.

These results are in sharp contrast with those obtained in the experiments with pieces of liver. Sections of those pieces revealed large spaces (Fig. 2) in the tissue, which had evidently been filled with gas, and

large groups of bacilli, the result of multiplication within the tissue. I ascribe this difference to the presence of glucose in the liver and its absence in the kidney, the glucose favoring the rapid and abundant evolution of gases free from oxygen.

A very striking and, it appears to me, very important result of the foregoing experiments is the demonstration which they afford of the unexpected ease with which these bacilli can establish and maintain anaërobic conditions when they have once begun to multiply in a medium suited to their growth. This fact enforces the necessity of prompt and thorough surgical treatment.

There is one factor in the problem of treatment the importance of which I have not been able to estimate in these experiments, and that is the inhibiting influence exerted upon the bacilli by living tissues. In the experiments which I have made the tissues have been dead, and whatever antagonism might have existed between living tissue and the bacilli was excluded. That such an antagonism exists and that it is considerable is shown by the fact that artificial cultures of the bacillus soon lose their virulence, and the bacilli they contain are incapable of multiplying in the bodies of living animals. How much the loosely combined oxygen carried to the tissues by the circulating blood may contribute to this result I am unable to say, but it is not improbable that it may have considerable influence.

Although the crucial test of modes of treating this alarming infection must rest on clinical experience, it appears to me that the few experiments I have made lead to the inferences that it would be wise to expose the tissues as freely as possible to the influence of oxygen, and especially to do away as thoroughly as possible with dead tissue, which would favor the multiplication of the bacillus, and the establishment of anaërobic conditions for its further increase. It appears not improbable that the immersion of the infected part or of the whole body in water, frequently renewed or oxygenated with peroxid of hydrogen, would meet these requirements, and, perhaps, by aiding the elimination of poisonous substances produced by the bacillus, diminish the intensity of the toxemia which seems to be a potent factor in causing the prostration observed in cases of this infection.

BACTERIOLOGIC REPORT BY DR. HARLOW BROOKS.

The material for examination was received at the Carnegie laboratory in a sterile test-tube in which it had been placed about seventy-two hours before. It was found to give off a very foul odor. Cover-slip preparations demonstrated the material to be made up of blood-clot and pus, in which were found many cocci, together with a large bacillus somewhat resembling the bacillus anthracis. The ends of the bacillus were slightly rounded, and in places a distinct capsule was evident. It reacted to Gramm's stain, also staining with the usual anilin dyes.

Inoculations were made on slant agar tubes, half of which were placed in the pyrogallate jar after the method of Buchner, and the remainder left under aërobic conditions. After forty-eight hours in the incubator the agar in both sets of tubes was covered with a profuse growth, those grown anaërobically being distinguished from the others by the very foul odor which emanated from them. Cover-glass preparations demonstrated the aërobic growth to be one of various cocci, while the growth in the anaërobic tubes was found to contain, in addition to the cocci, a large bacillus similar in form and staining reactions to that seen in the cover-glass preparations which had been made directly from the original material. In the growth, however, many of the bacilli were found in end-to-end pairs, in these pairs the length of each bacillus being somewhat less than the average length of the single bacillus. So active had been the production of gas in these tubes that in several the agar had been forced up from the bottom of the tube and the condensation-water was covered with small bubbles. The mixture with the cocci seems to have prevented the formation of any characteristic colonies.

Loops of the condensation-water which seemed most rich in the growth of the bacillus were inoculated into bouillon tubes, which, after being placed in the pyrogallate jar, were left in the incubator for twenty-four hours, at the end of which time the media was cloudy with growth, and the top of the fluid was covered with bubbles. Cover-slip preparations showed the same mixture as before, but the growth of the bacillus now predominated. One cubic centimeter of this mixed culture was injected subcutaneously into the abdominal wall of a large guinea-pig. After a few hours the animal became quite sick; it burrowed under the hay in the corner of its cage and cried and trembled when disturbed; the fur was ruffled and the eyes were kept closed. In a few days, however, full recovery apparently took place.

A few drops of the same culture was injected into the ear-vein of a rabbit, and five minutes later the animal was killed and placed on the incubator over night. In the morning great emphysema of the subcutaneous connective tissue over the entire body was found to be present. The eyeballs were forced from their sockets, and a blood-stained, foul-smelling fluid was escaping from the nostrils and mouth. Puncture of the skin gave vent to a gas which smelled

like ammonium sulphid, and burned with a pale-blue flame.

At the autopsy the liver was found to be soft, of a dull clay color, and many air bubbles were present beneath the capsule and throughout the entire substance of the organ. On stripping off the capsule the surface of the organ was found pitted with these air spaces, which were apparently the much dilated vessels. The kidneys were edematous, soft, and pitted with air spaces similar to those seen in the liver. The mucous membranes of the bladder and stomach were edematous and covered with bleb-like elevations. In many places the walls of the intestine were completely broken down by the extensive *post-mortem* changes in them. The heart was distended by bloody foam and by blood-clot riddled with air spaces. The lungs showed extensive emphysema with edema. The subserous and subcutaneous connective tissues of the entire body were infiltrated with bubbles of gas.

Cover-glass preparations which were made from the various tissues showed in every instance the presence of the large bacilli in great numbers, but cocci were found, as before, in all of the preparations. Small portions of the culture were spread over large surfaces of culture-media, and by this means it was possible, after some trouble, to secure isolated colonies from which pure cultures of the bacillus were obtained. The bacillus was found to be a broad, straight rod, about five μ in length. The ends were slightly rounded. In cultures it was often found in end-to-end pairs, evidently dividing in this manner. The bacillus, when found in the tissues, is surrounded by a broad, indistinct capsule, but this was not the case in the cultures. It did not form spores on the media on which it was grown, although it was not cultivated on blood-serum, as Dr. Dunham has shown to be necessary for the production of spores in the bacillus ærogenes capsulatus. It grew most luxuriantly in alkalin bouillon, and fairly well on agar-agar.

The rapidity of growth varied greatly. It seemed to grow much more slowly and in a less characteristic manner as the number of implantations increased. It grew only under anaërobic conditions, and very slowly, unless at the incubator temperature. The colonies appeared on agar-agar as raised, grayish, opalescent spots. The growth was most luxuriant where the medium was moist. Some of the most characteristic colonies developed between the wall of the tube and the body of the medium. The bacillus accepted the ordinary anilin dyes, and gave a very positive reaction to Gramm's stain. Motility was not present.

Injection of a pure culture of the bacillus into the circulation of a rabbit a few moments before the animal was killed gave rise to the emphysema as described following the intravenous injection of the mixed culture. Subcutaneous inoculation of guinea-pigs failed to produce fatal results, although in every instance the animal showed considerable reaction to the inoculation.

The bacillus found in this case appears to be identical with that described by Welch and Nuttal as the bacillus ærogenes capsulatus. It is difficult to determine the exact position which the bacillus bore in this instance, since, as from the history, it is plainly shown that death was due to infection, yet the mixed cultures made directly from the original material, when inoculated into guinea-pigs, failed to produce fatal results; but it must be remembered that about seventy-two hours elapsed between the time when the material was procured and when the first tube was placed in the incubator. It has been shown by Dr. Dunham that the bacillus ærogenes capsulatus, when first taken from a subject dying of the disease, is very virulent, producing death when injected into animals within a few hours, but that it soon loses this intense virulence as the material grows old or as the number of successive implantations increases. Taking this fact into consideration, it may safely be assumed that the time elapsing between the removal of the material and the first inoculation was sufficient for the bacillus to become to a large extent attenuated; but, unfortunately, in the absence of an autopsy we are unable to say whether the lesions present in this case were those which have been shown to be characteristic of this infection.

THE OPERATION ITSELF IN APPENDICITIS.[1]

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HITHERTO our discussions upon appendicitis have been directed for the most part to the pathologic condition as related to symptomatology with a view to early diagnosis and determination of the question of operative interference, with only brief and incidental consideration of the operative technic. The multifarious types presented by the disease, the variety in character and extent of the lesions, the several stages of progress in which operation is performed, the complications and sequelæ, compose a series of requirements in operating which may only be successfully met by the best surgical judgment and operative skill. In view of these facts, and the additional one that the profession has very generally

[1] Read at the Tenth Annual Meeting of the American Association of Obstetricians and Gynecologists, Niagara Falls, N.Y., August 17–20, 1897.

come to recognize appendicitis as a strictly surgical disease, cured only by operation, I have selected the operation itself as an appropriate and profitable theme for discussion at this time.

I propose to consider the subject under the following heads: (1) The incision. (2) Dealing with adhesions and with abscesses. (3) Removal of the appendix. (4) Drainage and isolation of the peritoneum by gauze.

The Incision.—Concerning the incision, three important considerations must be observed, the first being to obtain easy access to the *caput coli*, with sufficient working space, the second, to secure all natural advantages to facilitate drainage, and the third, to secure complete repair of the parietal structures incised and thereby prevent the occurrence of hernia.

The early operations for appendicitis were mostly undertaken in extreme cases, in which suppuration had occurred, and consisted in cutting into the abscess and evacuating and draining the same. For this purpose the vertical incision was adopted and is yet practised by many surgeons. This incision is made along the external border of the right rectus muscle, a little to the inner side of the right semilunar line. It should intersect a line drawn from the anterior superior iliac spine to the umbilicus, very nearly midway, and should be about three inches long. The sheath of the rectus had best be pushed aside slightly and not opened, so as to lessen the amount of bleeding. The muscles and fascia having been divided, the peritoneum is opened, and the *caput coli* found immediately beneath by the exploring finger. Kocher has called attention to the fact that a branch of the iliohypogastric nerve, which enters the sheath of the rectus, is divided by this incision. Atrophy of that part of the muscle supplied by this nerve has been observed after the operation. This incision furnishes good access to the parts involved; and when made and sutured under the protection of thorough asepsis, with proper management afterward, restores the integrity of the abdominal wall. In my early operations performed in this way, comprising a series of twenty-seven cases, mostly in the suppurative stage of the disease, the results were quite satisfactory. So far as I am aware, not one hernia occurred in the entire series.

The vertical incision does not, however, give as easy access to the appendix and to the outer and posterior areas adjacent thereto (which are so frequently involved) as does the oblique incision. The latter is preferable also for drainage, and affords an additional advantage by diminishing the danger of breaking through the inner wall when an abscess-cavity has formed about the appendix. This incision is made parallel with Poupart's ligament and traverses the line from the anterior superior iliac spine to the umbilicus well over to the right side. It enables the operator to explore the right iliac fossa from the external boundary, thus giving protection to the general peritoneum which may already have been shut off by protecting adhesions. In my recent work I have operated altogether through this oblique incision.

A method of dividing the abdominal wall by a combination of incision and blunt dissection has been described by McBurney and commended by many writers on the surgery of the appendix. This is an oblique incision, in which, after dividing the skin and superficial fascia, the fibers of the parietal muscles are separated by a blunt instrument and held apart with retractors while the peritoneum is divided and the appendix removed. This incision is only applicable to non-suppurative cases, according to its author, though some operators claim to have advantageously extended its application to those in which suppuration has taken place. The theory of this incision, of course, is that by tearing apart the bundles of fibers of the abdominal muscles, instead of dividing them by incision, the natural crossing of fibers in the muscular structure of the abdominal parieties is preserved, thereby preventing hernia as a post-operative sequel. These refinements are not practicable in cases of perforative appendicitis in which the life of the patient depends upon thoroughness of operation and free drainage. Moreover, it is doubtful if separating muscular structures with a blunt instrument yields any advantage over the division of those structures by incision, provided all proper care is bestowed upon closure and retention of divided parts by suturing. In grave cases of appendicitis, in which the patient's life hangs trembling in the balance, the incision should be made with a view to gaining access to the parts with sufficient working space and free drainage, other considerations being secondary.

In cases of recurrent appendicitis, in all cases in which there is no pus outside the appendix, and in all cases in which the requirements are properly met by a single drain, the utmost care should be bestowed upon the suturing of the incision. In these cases I have used the through-and-through suture with silkworm gut, together with immediate suture of divided muscle and aponeurosis with interrupted sutures of catgut. In these non-suppurative cases the silkworm-gut sutures should be allowed to remain for ten or twelve days. In suppurating cases, when extensive gauze packing and drainage prevent immediate closure of the incision, one angle of the wound should be brought together as far toward the middle of the

incision as practicable, and the remaining sutures of silkworm gut left untied until they may be utilized. The latter are the cases in which hernia is so often a sequel to operation and I do not see that any method of suture can overcome this danger. They are really cases in which the open treatment is an absolute necessity. Patients treated in this manner should be required to remain in bed much longer than is customary, until organization and consolidation of the new tissue formation uniting the incised parieties are complete. This will do more toward the prevention of hernia in this class of cases than any particular method of incision or partial closure of the same.

Adhesions and Abscesses.—In dealing with adhesions and abscesses the same general rules of surgical treatment should be observed in appendicitis as in similar conditions affecting other organs enclosed within the peritoneum. Whenever practicable, adhesions should be separated, abscesses emptied, disintegrated structures composing foci of infection removed, and cleansing and drainage secured by measures of assured efficiency. It is an established procedure in pelvic surgery to incise and drain accumulations of pus in exhausted subjects as an operation of expediency, looking to improved conditions for radical operation and permanent cure. In a limited proportion of cases, Nature completes the cure after such an incomplete operation. The same methods and similar results obtain in the treatment of appendicitis. The function of surgery is to save life; the attainment of ideals should be altogether subordinate to this supreme indication of all surgical operations. This axiom is eminently applicable to the disease under consideration, and, at the same time, we must concede that incomplete operations do not, as a rule, beget cures. In all operations for appendicitis, in all stages and varieties of the disease, the appendix should be removed whenever the patient's condition will permit completion of the operation. I am aware that many excellent surgeons endorse and pursue the practice of evacuating an appendicular abscess-cavity, affording drainage, and partially closing the incision without any attempt to remove the appendix and close the cecum at the point of sloughing. Though this may be the better practice for the occasional operator, it is far from safe to leave within the abdomen a perforated and sloughing appendix. While a certain proportion of these patients recover under an incomplete operation, the aggregate of results, including cases of fecal fistulæ and secondary operations, is not equal to that of completed operations. This conviction has not been formed from theory or by analogy. I have opened appendicular abscesses which have burrowed along the intermuscular planes to a point in the lumbar region, and other remote points and in numerous instances the patients have recovered after protracted convalescence. On the other hand, I can cite numerous instances in which this procedure has failed. Four years ago I operated on a young woman, aged twenty-four, with suppurative appendicitis. Her condition was critical when first seen and operation was promptly performed. On opening the peritoneum through the usual incision and introducing the finger, pus poured from the wound. The insertion of a drain completed the operation. Convalescence was imperfect and ten days later the pulse, temperature, and general symptoms gave unmistakable evidence of continued suppuration. A second operation was performed and an abscess posterior to the cecum evacuated. The abscess-cavity was irrigated and deep drainage established. The patient made an incomplete recovery and suffered another attack three months later, when I again operated and removed the inflamed stump of an appendix. Recovery was prompt and the cure complete. Much suffering and no small risk to life would have been avoided had it been practicable to complete the operation with safety the first time. I do not mean to question the wisdom of refraining from searching for accumulations of pus by separating adhesions, from searching for the appendix, and from completion of all details when the patient is too feeble to bear such an operation. But when it is practicable to do so, I am sure the patient's welfare is best subserved by a complete operation.

In some cases of appendicitis, known as the fulminant type of the disease, the progress is so rapid that no confining wall of lymph is formed. In such cases the peritoneum is filled with serous effusion mingled with flakes of lymph, and general septic symptoms proceed with great rapidity. A perforated and gangrenous appendix will be found. Thorough irrigation of the peritoneum far and near, with drainage, constitutes the essential parts of the operative procedure.

The most common abscess location, in my experience, is posterior to the cecum. The exploring finger, passed down beside the external surface of the cecum, will enter the abscess-cavity. Less frequently the abscess will be found anteriorly. The omentum, cecum, and coils of intestine, with the parietal peritoneum compose the confining area. The appendix will be readily found in the abscess-cavity. Again, the pus may be confined by adhesions within the pelvis. These are the cases in which fluctuation may be detected by rectal palpation.

In these several locations the general peritoneum, preparatory to evacuation, should be isolated by

careful packing of gauze. When the abscess is postcecal, long strips of gauze should be carefully tucked in position before carrying the exploration to evacuation of the abscess. There are three directions for gauze packing under these circumstances—in the pelvis, toward the median line, and toward the lumbar region. As the pus is evacuated, the patient is turned toward the right side and the pus carefully wiped away with loose gauze pads. The cleansing should be completed by thorough irrigation with warm salt solution, using for this purpose a small glass nozzle attached to the irrigator. Careful and gentle exploration should be made for additional accumulations of pus. When the abscess formation is localized in the other regions indicated, the same methods of evacuating and cleansing, with proper protection of the outlying peritoneum by gauze, must be observed. My experience compels me to look to thorough irrigation as the most potent of all our resources in this all-important part of the operative procedure. I place no reliance upon the use of peroxid of hydrogen, iodoform, or other chemic germicides here, but believe mechanical cleansing by washing, with the accompanying attenuation, will do more to arrest septic processes and save the patient than all other agencies combined.

Removal of the Appendix.—The cecum appears in several types in the adult, four distinct typical forms being described by anatomists generally. The appendix in man is the cecum of some lower animals in an undeveloped state. In the early period of fetal life the cecum with its vermiform appendix is near the umbilicus and descends into the right iliac fossa about the sixth month. Abnormal positions of the appendix, such as to the left of the median line and other similar displacements, are due to failure of descent of the cecum. The average length of the human appendix is about three and one-half inches, but it may vary from one to nine inches. While the cecum may in exceptional cases be only partially invested by the peritoneum, as a rule it is entirely covered by peritoneum and hence free and mobile in the abdominal cavity. The triangular folds of peritoneum forming the meso-appendix are reflected from the ileum to the appendix. The artery, vein, and lymphatics which supply the organ pass between the two layers of the meso-appendix. This process of the peritoneum varies in length and thickness, and also in the extent of its infolding of the appendix. The mobility of the appendix depends upon the length and breadth of the meso-appendix, and hence has a varying range of movement in various subjects within physiologic limitations. In the female there is a prolongation of the meso-appendix extending to the right ovary, which conveys an additional vascular supply to the appendix and which has been called the appendiculo-ovarian ligament. To this additional blood-supply has been attributed an increased vitality, rendering women less disposed to appendicitis than men. The appendiculo-ovarian ligament may also facilitate the extension of inflammatory processes between the appendix and ovary, which I have frequently found to obtain.

From this cursory recital of some of the important anatomic relations of the cecum and its appendix, it is apparent that the latter is normally endowed with an extensive and varying range of mobility. It would be more accurate to say of the appendix that it may normally occupy various positions and possess varying degrees of mobility in these several locations. It has been attempted by Bristow, Fowler, and others, to make a definite numerical classification of the normal positions of the appendix. Such refinement of description is of doubtful value as a working basis under pathologic conditions. Normally it is about the *caput coli*, often found toward the median line, below the pelvic brim, alongside the cecum externally, and even underneath the cecum.

When fixed by adhesions and surrounded with inflammatory deposits, agglutinating adjacent serous surfaces, it becomes a difficult task to find and isolate the appendix. In many instances of suppurative appendicitis, that organ will have died, appearing in the abscess as a black slough. In other instances it will have been disintegrated by the destructive process and only a stump will be found to mark its site. The corrosive process of suppuration will, in some cases, erode in spots the structures of the cecum; in more than one such case I have found it necessary to pare away the rotten tissues and suture the openings in the gut.

When the incision has been completed through the peritoneum, the cecum and appendix should be brought up through the wound. In non-suppurative cases, by following familiar anatomic guides, the exploring finger will usually detect the appendix before bringing forward the cecum. In suppurative cases the greatest difficulties will be encountered. The anatomic and pathologic facts already given, together with the careful guide of an educated touch, must be utilized to discover and deliver the organs. When the appendix is in hand, the cecum should be returned into the abdomen, and gauze wrung out in hot water placed around it. In my early operations I ligated the appendix with the meso-appendix, using fine sterilized silk, cut away the appendix, and applied pure carbolic acid to the stump. Later, I adopted the modern method of transfixing the meso-appendix at its base, cutting it away, stripping back a cuff of peritoneum from the appendix down to its

junction with the cecum, ligating the appendix with fine silk and cutting it away, afterward sterilizing the stump, invaginating the stump into the cecum, and covering it with peritoneum by careful stitching after the Lembert method. Nothing in the progress of healing or in ultimate results indicated any advantage of the latter method over the former simple ligature, excision, and cauterization. Careful study of the method of invagination from time to time persuaded me that its advantages were more theoretic than practical. Indeed, if carefully studied with the parts in sight, it will be seen that the invagination is only into the coats of the cecum. An infected ligature would more readily find its way into the peritoneum than into the lumen of the gut. More recently I have adopted a method of treating the stump, which, after I had applied it for some time, I found had been published by Dawbarn. It consists in passing an interrupted suture of fine silk in a circular manner around the stump, catching up the peritoneum and bringing it over the stump as with a purse-string. I deem this preferable to the method of invagination. The silk used for ligature of the appendix and meso-appendix, and for suturing, should be of the size that will supply requisite strength with the least bulk. In cases of recurrent and relapsing appendicitis, wherein there is no pus outside the appendix, this part of the operation can be most satisfactorily completed; in suppurative cases there must be thorough cleansing, and the ligature and sutures must be placed in tissues of good vitality if we would avoid the troubles of infected ligature and a sinus afterward.

In cases in which the appendix is necrotic, it is not sufficient to leave the stump to separate under the protection of drainage, *provided the patient's condition will permit prolongation of the operation sufficiently* for proper closure of the point of separation. In these cases the necrotic process extends to the coats of the cecum and fecal fistula is a common sequel. While such a fistula will usually heal spontaneously, it does not always do so, and, when practicable, this complication should be averted by excision and suture of the gut. In these cases the dead tissue about the stump should be trimmed away with scissors and the opening thus made closed with two rows of fine silk sutures. When the patient's condition is extremely bad from progressive sepsis, the operation should not embrace these detailed attentions to the stump; but there is a certain proportion of suppurative cases wherein with rapid (not hasty) work such completed operative work may be most advantageously applied.

In all suppurative cases the clean peritoneum must be protected by gauze during the manipulations upon the appendix and its stump, both from the foul appendix and the bed in which it lay. Throughout the entire operation the highest skill of the operator will be brought to bear upon the protection of the outlying area of peritoneum from infection.

Drainage and Isolation of the Peritoneum by Gauze.—In no class of intraperitoneal operations does drainage perform more essential functions than in operations for suppurative appendicitis. In cases of recurrent appendicitis operated upon in the interval of course drainage will not be required. That class of cases, also, in which suppuration is confined within the coats of the appendix, permitting accurate sterilization and infolding of the stump, will not need drainage. But in the cases in which perforation and suppuration have obtained, either with or without a limiting wall of exudate, drainage will be a most essential part of the operative technic.

The right iliac fossa is not the most dependent pouch of the peritoneum and hence glass tubular drainage supplemented by suction cannot be applied as in pelvic surgery. Here we must rely upon tubular drainage with rubber and capillary drainage with gauze. Rubber tubing of firm material which will bear considerable compression without closure should be selected; and sterilized gauze, untreated by any chemicals, is best adapted to this purpose. Gauze which has been iodoformized drains very inefficiently, its capillarity being impaired by the filling of its meshes with the chemic agent.

The extent of drainage must necessarily vary within wide limits. In certain cases only a small strip of gauze passed down to the bed formerly occupied by the infected appendix to prevent too quick closure of the parietal incision may be all that is required. In cases in which no adhesions had been formed between anterior peritoneum, omentum, and visceral peritoneum beneath, strips of gauze must be placed in different directions so as to assure drainage of the general peritoneum. These strips should be placed endwise, especial care being given to drainage from the direction of the deep pelvis, the spleen, and region beneath the liver. The ends must, of course, be brought out of the most dependent angle of the incision. This drainage had best be supplemented by a rubber tube passed down to the area immediately about the *caput coli* where the focus of infection was localized.

After removal of the appendix, and cleansing of the peritoneum, strips of gauze should be placed for the double purpose of drainage and forming a wall between the infected area and the general peritoneum. Within twenty-four hours the meshes of the gauze will be filled with lymph, forming a protecting wall. This is a most important function of gauze

and is utilized with greater advantage here than in any other class of operations. The gauze should not be removed before the third day, and then one strip at a time, beginning with the central piece and preserving the outlying barriers, until the fourth day. After the general peritoneum is securely shut off it is only necessary to maintain drainage down to the focal area about the head of the cecum. Should discharge therefrom appear at this time, the drainage-track should be frequently washed out. Fecal fistula will require constant care to cleanse and protect the wound. A fecal fistula which otherwise would heal may be kept open indefinitely by persistent efforts at drainage. Throughout the period of drainage the patient should remain in bed and union of the incised parietes should be facilitated by adhesive straps and bandages, with constant recognition of the possibility of the occurrence of hernia.

THE TREATMENT OF FORTY-THREE CASES OF DIPHTHERIA WITH ANTITOXIN.

BY IRA D. PAYNE, M.D.,
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HAVING read with interest the reports in THE MEDICAL NEWS of the treatment of diphtheria with antitoxin, I wish to add the results of its use in forty-three cases of the disease which have been treated by me since February 19, 1896. The report by Dr. Biggs of New York of more than 1200 cases of diphtheria, treated by means of serotherapeutics, might not be conclusive to one inexperienced in the use of the serum, but to one who has used it the tabulated cases are of marked interest.

I treated my first case with antitoxin February 19, 1896. The patient was a baby nine months old who had been sick four days with what the parents termed a very bad cold. Examination revealed a membranous deposit in the larynx with indications of an invasion of the trachea. Temperature 100° F., pulse 140, respirations very labored and slow, with marked cyanosis. The baby had not nursed for twenty-four hours. I injected under the skin over the abdomen 1000 (10 c.c.) units of antitoxin prepared recently by Dr. Walter L. Biering of the Medical Department of the State University of Iowa. I gave internally $\frac{1}{30}$ of a grain of bichlorid of mercury every three hours. After twenty hours I again visited my patient. Examination revealed a membranous deposit in the pharynx, and in each tonsil. Temperature 100¼° F., pulse 140, breathing still labored, patient cyanotic, had not taken any nourishment since my previous visit. I injected another 1000 units of antitoxin, continued the bichlorid of mercury as before, and made an application every hour of permanganate of potash, 10 grains to 1 ounce of distilled water, to the membrane.

February 24th, I found marked improvement. Temperature 99° F., pulse 140, breathing quite normal, no cyanosis. Baby had taken nourishment five times. I now made one more injection of 500 units, after which the patient had an uninterrupted convalescence.

On my second visit I removed from one of the tonsils a small section of membrane and subjected the same to a microscopic examination at the Medical Department, State University of Iowa, which confirmed the diagnosis. Following this case I treated five other patients with antitoxin, all of whom made a good recovery. In no case has more than three injections of antitoxin been necessary, and while my notes do not show the number, I feel quite sure that two-thirds of the patients required but one injection of 1000 units.

Five of the forty-three cases treated were of well-defined diphtheritic croup, all of which would probably have proved fatal under other treatment. About one-fourth of these cases I treated with antitoxin only, and could not see but that convalescence followed as early and as rapidly as when other remedies were used in conjunction with it.

The initial dose I have employed has in no case been less than 1000 units, and in one case, a little girl three years old, the initial dose was 2000 units, followed after eighteen hours by 1000 units more, with a favorable result. I have used for immunizing purposes about 150 injections of antitoxin from the following laboratories: Behring's of Germany, Mulford's of Philadelphia, and Biering's of the State University of Iowa. About one-half came from Mulford's laboratory. In no case have I seen any bad results follow, other than a slight urticaria, and only five cases of this, four of which followed the use of antitoxin which had been prepared ten months before.

My experience has led me to believe that the fresher the preparation of antitoxin the more rapid the effect. The mistake usually made in the treatment of many cases of diphtheria is in the use of too small a quantity of antitoxin for the initial dose. In any malignant form of the disease I would deem it rational treatment to use, with patients from two to ten years old, anywhere from 2000 to 4000 units as the initial dose; to be repeated in fifteen hours if symptoms indicated it. In cases of diphtheritic croup, when death seems imminent, I believe it advisable to first use antitoxin, and then intubate or perform tracheotomy.

We are warranted in the statement that what would be a mild form of diphtheria elsewhere, in the larynx and trachea would probably prove fatal.

Hence I can see the good results from tracheotomy or intubation in such a case, and by so doing save the life of the child.

Forty-two of the forty-three patients treated by me recovered. The fatal case was that of a child two years old, sick three days with diphtheritic croup. When first visited, 1000 units of antitoxin was injected; twenty hours later the child died.

Through the kindness of Drs. Noel and Thornburg of Redfield, Iowa, I was permitted to visit in February, 1896, five cases of diphtheria, all of which proved fatal. They had treated seventeen cases of diphtheria without antitoxin and eleven of the patients had died. With this record before them they commenced the use of antitoxin, and have treated since February, 1896, until the present time, about thirty-five cases with no deaths. The letter of Dr. S. E. Blaisdell of Brooklyn, N. Y., to Dr. Joseph E. Winters of New York, in which he states he has used antitoxin in thirty-one cases of diphtheria, and has yet to see a single case, either mild or severe, benefited by it, is an experience widely different from the results we have had following its use. While slow to believe in specific medication, we are forced to admit that in antitoxin properly prepared and rightly handled, we have as near a specific for the treatment of diphtheria as we have in quinin for malaria.

AMAUROSIS FOLLOWING INTRANASAL OPERATION, WITH A REVIEW OF SOME OF THE UNCOMMON RESULTS OF OPERATIONS WITHIN THE NOSE.

By FRANCIS R. PACKARD, M.D.,
of Philadelphia.

A man, thirty-six years of age, came under my care for a hypertrophic rhinitis of very severe type. He had been treated by several specialists for the nose and throat, and had undergone many minor operations during the past few years. The hypertrophic tissue had been treated by galvanocautery, caustics, and by the cold-wire snare.

During February of this year I used the cold-wire snare (under cocain anesthesia) to remove a small piece of hypertrophied tissue from the anterior extremity of the middle turbinate bone of the left side. Two days later the patient returned and informed me that on the day following the operation he had, while writing, suddenly become blind in the left eye. He had gone at once to the office of a well-known oculist, and while waiting there had found that his vision was beginning to return. Before the doctor had finished his examination it was almost completely restored. The period of complete left-sided blindness was stated by the patient to have been between twenty and thirty minutes. The oculist has informed me that careful examination failed to reveal a cause for the disturbance of vision. When I saw the patient the site of operation presented a perfectly normal appearance. Since that time I have frequently used the cold-wire snare in the further treatment of the patient, and have also employed chromic acid for cauterization, but no further unusual circumstances have attended the case.

The first to direct the attention of the profession to the occasional evil consequences of minor intranasal operations was Ziem.[1] He reported two cases of violent delirium following the application of the galvanocautery to hypertrophic nasal mucous membrane, and one case in which delirium occurred after the evacuation of an abscess of the antrum of Highmore. His fourth case was that of a woman who, on the day subsequent to galvanocauterization of hypertrophied tissue over the posterior extremity of the lower turbinate bone, was suddenly stricken with dimness of vision on the corresponding side. Ophthalmoscopic examination revealed hyperemia of the optic papilla with very marked venous pulsation. He also reported the case of a woman, twenty-five years of age, of very nervous temperament, who, for one week following the application of the galvanocautery to the anterior extremity of the left lower turbinate bone, suffered from diminution of the field of vision of the left eye, accompanied by considerable hyperemia of the eyeground. In Ziem's last case, that of a woman twenty-four years of age, marked congestion and venous pulsation of both optic papillæ were noted after similar treatment of the lower turbinate bones on both sides. Later, Ziem[2] reported three further cases of one-sided dimness of vision following the use of the galvanocautery in the nasal cavity of the same side.

Lermoyez,[3] in a very exhaustive article, has classified the casualties or complications which follow intranasal operations as follows:

1. *Of Infectious Origin.*—Diffuse rhinitis, submucous abscess, diphtheria of the wound, conjunctivitis, otitis media, tonsillitis, facial erysipelas, meningitis, arthritis, pyemia, unclassified infections, postoperative scarlatina, awakening of diatheses.

2. *Of Nervous Origin.*—Neuralgias, migrains, syncope and vertigo, visual disturbances, asthma, laryngeal spasm, exophthalmic goiter, general depression.

3. *Of Mechanical Origin.*—Hemorrhage from the nose and permanent redness of the nose.

Lermoyez also considers these casualties severally. In regard to meningitis, he points out that it may be a result either of metastasis or of direct extension of an inflammation of the nasal mucous membrane.

He states it to be invariably fatal. Voltolini[4] was the first to record this complication as occurring after the removal of nasal polypi. Lermoyez quotes Krakauer's observation of an acute arthritis of the left elbow consecutive to the removal of a sarcoma from Rosenmüller's fossa. Pyemia, he states, was reported by Schneider[5] to have followed the removal of a nasal polypus in an epileptic. Under the term "unclassified infections" Lermoyez includes headache, malaise, irritability, pyrexia, and anorexia. As an instance of the "awakening of a diathesis" he cites the well-known case reported by Curtis,[6] in which a minor intranasal operation caused the outbreak of an attack of gout.

My case, with the cases of Ziem and with some others yet to be mentioned, should, of course, be placed among the visual disturbances under the head of nervous complications. Lermoyez quotes Rosenberg's[7] report of a very mild galvanocauterization for vasomotor rhinitis which resulted in complete loss of vision, lasting seven minutes. Lemon's[8] case of exophthalmic goiter following nasal cauterization is the only instance of this character noted by Lermoyez. His one case of permanent reddening of the nose was observed in a woman in whom the condition was induced by galvanocauterization.

Bresgen[9] has reported a case of necrosis of the nasal bones and diminution of the field of vision consequent to the unskilful use of the galvanocautery. Ophthalmoscopic examination was negative in this instance.

Cheatham[10] has seen two cases in which intranasal cauterization by chromic acid was followed by edema of the lids and conjunctivæ. He remarks that after this treatment patients are more apt to complain of pain in the eyes than in the nose.

Rethi[11] has noted persistent sneezing and vertigo as sequels to galvanocauterization, relieved only by excision of the scar-tissue. In another case laryngeal spasm was similarly caused and cured. In two other cases seen by Rethi vertigo and supra-orbital neuralgia following intranasal cauterization persisted in spite of excision of the scar.

Aronsohn[12] tells of the occurrence of asthma subsequent to the removal of a fibrous polypus from the middle turbinate bone. A cure was effected by excision of the scar.

Laurent[13] had as a patient a man twenty-six years old, suffering from hypertrophic rhinitis. The obstruction to nasal respiration was removed by applications of chromic acid and the galvanocautery, but the man subsequently suffered from asthmatic attacks, attributed by Laurent to the contraction of the scar-tissue upon the terminal fibers of the trigeminus in the nose.

C. H. Knight[14] reports the case of a girl nine years old, in poor physical condition, from whose nasopharynx adenoids were removed by the curette, under ether. Twenty hours after the operation she developed well-marked torticollis, accompanied by a mild febrile condition. Examination of the nasopharynx forty-eight hours after operation showed the wound to have a sloughing surface, with swollen and angry-looking margins. The child, however, improved rapidly, and in ten days the rigidity of the neck and all traces of the operation had disappeared. Knight attributed the torticollis to reflex irritation.

Max Thorner[15] records a case much resembling my own in some of its details, in a man forty years of age. Numerous polypi had been removed from his nose by means of the cold-wire snare, and to the few which still remained between the middle and lower turbinate bones on the right side Thorner applied the galvanocautery. On one occasion the right eye became affected on the day following such a cauterization; the patient was conscious of light, but could not count fingers at five feet. Ophthalmoscopic examination was negative. Vision improved after five days, and was entirely restored within four or five weeks. Thorner also reports the development of a curious mental condition, with loss of memory, in a boy from whose middle turbinate bone some hypertrophied tissue had been removed. He recovered completely in a few months, and his subsequent treatment was uneventful. In another instance the removal by snare of an hypertrophy from the anterior end of the left middle turbinate bone produced an intense neuralgia of the left side of the face, lasting several days, and a severe spasmodic cough, which persisted for two weeks.

J. F. Ingalls[16] concludes, from a large number of interesting statistics, that intranasal galvanocauterization is almost free from ill results if due care be observed by the operator in the manipulation of his instruments and in the details of his antisepsis. Inflammation of the Eustachian tubes and middle ear he attributes to a burn of the orifice of the tube, to the excessive inflammatory reaction of an over-large wound, or to a lack of antiseptic precautions. Ingalls has never known tonsillitis to result from intranasal cauterization. In 4 cases out of 2600 the procedure was followed by an erysipelatous eruption on the face. He has records of 1900 cases of hypertrophic rhinitis, with 2800 cauterizations, none of which had a complication of any consequence.

In conclusion, I would briefly call attention to the anatomic relation between the parts concerned in these intranasal operations and their sequelæ. The arterial supply of the nose is derived chiefly from branches of the ophthalmic and internal maxillary

arteries, which form a mesh beneath the mucous membrane. Some of the veins from the nose empty into the ophthalmic vein, others into the facial vein, and some terminate in the veins within the cranium. For the nerve-supply there are the olfactory, the nasal branch of the ophthalmic division of the fifth, and numerous filaments from Meckel's ganglion. It is thus readily seen how close is the arterial, venous, and nervous connection between the eyes and the nasal fossæ, direct communication being afforded in addition by means of the nasal duct.

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CLINICAL MEMORANDA.

SARCOMA OF THE KIDNEY—ABDOMINAL NEPHRECTOMY—RECURRENCE AFTER FIVE MONTHS—DEATH IN ONE YEAR.

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E. Z., female, aged five years, was referred to me by Dr. J. S. Brown of Montclair, N. J. The general health of the child had been good up to about four months before I saw her, when her mother first noticed an enlargement of the abdomen. This had steadily increased until her health became seriously affected, and as the condition was looked upon as inoperable, it was hoped that inoculation of erysipelas toxins would prove of benefit.

I found upon examination that the abdomen was nearly filled by a firmly fixed, hard tumor, that apparently had its origin in the region of the left kidney, and which extended beyond the median line and down into the pelvis. A diagnosis of sarcoma of the kidney was made, and, as it seemed possible to remove the growth, with the assistance of Dr. B. Farquhar Curtis, I operated on September 25, 1894.

An incision four inches long was made parallel with the outer border of the rectus muscle, and from the center of this a transverse incision was made, extending about three inches to the left. The tumor was found to be adherent to the overlying colon, but was shelled out with but little difficulty. Only a very small quantity of blood was lost, and the shock was slight. The pedicle, not more than three-eighths of an inch in diameter, was found and ligated with silk, the peritoneum closed, and a gauze drain introduced which passed down to the stump, but outside of the peritoneum. With the exception of a sinus which persisted for two or three months, the wound healed promptly and satisfactorily. The patient gained rapidly in flesh and strength, and was presented before the New York Surgical Society on November 14, 1894. The weight of the tumor was three pounds. Microscopic examination by Dr. H. T. Brooks, pathologist to the Post-Graduate Hospital, showed the tumor to be a mixed-cell sarcoma, with spindle-cells predominating.

The patient continued in perfect health until the early part of May, 1895, when a small tumor was detected, apparently originating in the retroperitoneal glands near

FIG. 1.

Sarcoma of the kidney in a child five years of age.

the site formerly occupied by the kidney. The tumor increased very rapidly in size. The quantity of urine passed by the patient was much diminished, was of high color, and contained some albumin and blood. She was put upon small doses of the filtered toxins of erysipelas and bacillus prodigiosus, which were injected every other day into the gluteal region. Her general health quickly began to improve, and her urine increased in quantity and became nearly normal. The injections were continued during May, June, and July, 1895, but not in sufficient doses to produce a chill. Treatment had to be carried out at my office, hence only small doses could be given.

In August there was a well-marked increase in the size of the tumor, and the health of the patient again became

impaired. The use of the toxins was discontinued. The growth of the tumor was enormously rapid, and by the latter part of September the abdomen was filled by it. Emaciation was progressive and rapid, and the patient

FIG. 2.

Spindle- and round-celled sarcoma of the kidney. Weight, 1400 grams.

died in the middle of October, 1895. The accompanying illustration shows the condition of the tumor prior to operation.

Sarcoma of the kidney has long been regarded, and rightly so, as very nearly a hopeless condition; hence, much difference of opinion is entertained by surgeons as to the advisability of subjecting such patients to an operation. The brilliant results reported by Dr. Abbe before the New York Surgical Society (two of his cases having remained well for more than three years) are certainly most encouraging. However, the fact that Dr. Abbe's experience has been so different from that of most other surgeons, together with the circumstance that one of his patients has had a recurrence of the disease more than four years after operation, force us to conclude that, in spite of improved methods, we must still give a very grave prognosis in cases of sarcoma of the kidney.

Lotheisen, in his admirable article on "Surgery of the Kidney,"[1] states that, of eleven patients operated upon for malignant tumor of the kidney, only one was well beyond two years, and the growth was an adenocarcinoma. Of the five cases of sarcoma, all the patients died of recurrence.

THE DIURETIC ACTION OF MERCURY IN CARDIAC DROPSY.[2]

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RECENT authorities universally agree that dropsical accumulations arising from obstruction to the circulation from valvular disease are best treated with cardiac tonics and stimulants, and that chief among these remedies are digitalis, strophanthus, diuretin, and caffein, Most writers assert that digitalis acts best after a calomel purge. I have frequently seen digitalis and iron fail utterly until the patient was thoroughly purged with a mercurial, after which the former remedy could be resumed with benefit.

The following cases in the writer's practice will illustrate not only the diuretic action of mercury, but also the disadvantages attending its continuous use:

During 1893 and 1894, Mrs. W. had been troubled with palpitation and irregular action of the heart, and marked dyspnea upon slight exertion. Failure of compensation, however, did not set in until the fall of 1895. A careful examination at this time revealed a moderately enlarged heart, acting feebly and irregularly. A mitral presystolic murmur could be heard near the apex, and serious pulmonary complications were also present. The abdomen contained a moderate amount of fluid, and the lower extremities were dropsical. The stomach was very irritable, and the digitalis and caffein which she took was more often vomited than retained. The heart was acting so feebly and irregularly that strychnin was given hypodermically thrice daily for several days, but the attacks of dyspnea and cyanosis persisted.

These distressing symptoms were partially relieved by hypodermic injections of morphin and atrophin. The cardiac stimulant was discontinued, and three grains of calomel with soda was given thrice daily. Its purgative action was quite pronounced, and the effect seemed beneficial. Opium was often prescribed with the calomel in order to control the looseness of the bowels. After a few days it was noticed that the amount of urine was greatly increased, and twice when measured it was found to be more than eighty ounces per day. At the expiration of ten days of the treatment all of her symptoms had improved. The dropsy was rapidly decreasing, the pulse was more regular, and the breathing more natural. At this time, however, the calomel began to affect her gums, and she refused positively to continue its use. Her condition gradually became worse in spite of tonics and diuretic remedies, and several months later she succumbed to the disease. The diuretic action of calomel in this case was marked, and it was more efficient in this respect than were the remedies which were subsequently employed.

The next case was one of cirrhosis of the liver, with marked ascites. As Palma[1] had reported the diuretic action of calomel in this condition I determined to make use of it in this instance. During a week the patient took ten grains of calomel daily. The purgative action was severe; but no diuretic action was noted, and, the gums becoming affected, the treatment was discontinued. He was tapped several times before he died.

Mercury was given Mr. W., a man about sixty years of age. His heart was greatly enlarged. A systolic murmur was heard in the second right interspace, and was traceable over the ascending arch. Palpitation was annoying, and the pulsation of the vessels in the neck was plainly noticeable. Failure of compensation had existed for some time. The abdomen and limbs were extremely dropsical. Breathing was superficial and difficult, and cough and expectoration annoying. The various diuretics he had been taking during several months seemed

[1] *Archiv. f. klin. Chirurgie*, Band 52, S. 721.

[2] Read before the Dubuque (Iowa) Medical Society, June 30, 1897.

[1] Quoted by Pepper, THE MEDICAL NEWS, December 15, 1894.

to afford him no relief, and as the accumulation of fluid was increasing, the remedies were discontinued. He was now given 8 grains of calomel daily for four or five days. The remedy acted moderately on the bowels, but produced so much griping pain and distress that the dose was reduced to 3 grains, with soda and jalap, and this was given for several days. There being no perceptible increase in the amount of urine passed this line of treatment was stopped. A few months after this he succumbed to the disease. The use of calomel in this case was a *dernier ressort*, but it produced no benefit.

Mr. B. was seen in consultation. The examination showed enlargement of the heart, with feeble and irregular action. A mitral systolic murmur was heard in the sixth interspace. The abdomen contained fluid, the limbs were dropsical, and a hacking cough was incessant. He was unable to lie down and could sleep for only a few minutes at a time. His condition was so serious that his death was expected at any moment. During four months he had been under treatment, chiefly with digitalis. I saw him in December, 1896, and it was agreed to discontinue the use of digitalis. Sufficient morphin was given hypodermically to secure him several hours sleep. This afforded so much relief that the drug was given nightly for a number of nights. Ten grains of calomel was administered, and this was followed in three hours by a dose of jalap. The action upon the bowels was prompt and beneficial. Six grains of calomel was now given daily. The nightly doses of morphin probably restrained the purgative action of the mercury. He began shortly to pass more urine, and, while it was not measured, it was thought to amount to four or five pints daily. During two weeks he continued to take from four to eight grains of calomel a day. Antiseptic mouth washes were constantly used. The dropsy subsided gradually, his stomach was no longer irritable, and his breathing became freer and easier. He was soon able to be up and about, and, I believe, is still living.

This report has been condensed as much as possible, and but passing reference has been made to the action of other remedies used before resorting to mercury. Much of the benefit obtained from the use of this drug no doubt arises from unloading the bowels, relieving the engorged and congested condition of the liver, and removing impurities from the system. Nor is this all; it undoubtedly causes diuresis in dropsical patients by causing serum to be reabsorbed and eliminated by the kidneys. Mercury differs from digitalis as a diuretic in the fact that its action in this respect is sooner lost. When the remedy is resumed, however, after having been suspended, it again causes diuresis. Murray states that this remedy acts, not only as an eliminative and alterative, but also upon the heart itself. I have seen nothing to warrant me in accepting this conclusion..

It must be borne in mind in estimating the value of mercury as a diuretic that several disadvantages attend its continuous use. Among these are its pronounced purgative action and the griping pain which it causes, both of which are controlled with difficulty. Even with the most careful management stomatitis will often result, and, furthermore, the diuretic action is not uniformly produced. Notwithstanding these drawbacks, however, mercury has a place as a diuretic. In most cases in which a diuretic is necessary the use of mercury is not indicated, but in those in which other remedies have been administered during so long a time that they have lost their effect it may be administered, often with benefit.

A CASE OF CHYLOUS ASCITES.

By J. A. DAY, M.D.,
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I DESIRE to report a case which is unusual, judging from the limited amount of literature bearing upon the subject. The case in question is one of ascites, the fluid of which I believe to be of a chylous nature.

My attention was attracted to the patient whose case I present about two and one-half years ago, and the following history elicited: Mr. J. H., aged fifty-four years; height, 5 feet 10 inches; weight, 160 pounds; family history, good. His previous health had been excellent until about twelve years before, when he had an attack of what his attending physician termed catarrhal fever, which, as he states, was attended with dull pain in the left hypogastric region, and a feeling of fulness and oppression all over the abdomen. Shortly following this attack he had edema of both lower extremities, penis, and scrotum, which varied in intensity from time to time, and has continued until the present, although his general health has remained good, and he has always led the active life of a farmer until about three years ago, when he was obliged to abandon hard work in consequence of an enormously distended abdomen. He was ignorant of the true nature of his condition, which in reality was caused by a large accumulation of fluid in the abdominal cavity. The attending physician seemed to have overlooked this very distressing condition, which persisted until about the middle of February, 1895, when he consulted another physician in a neighboring town, who made a diagnosis of ascites, and drew several quarts of yellowish-white fluid resembling milk from the abdominal cavity. He had undergone this procedure twice before coming under my observation.

Paracentesis was performed April 6, 1895, by my father and myself, and we removed about three gallons of fluid resembling rich milk, of a specific gravity of 1010, with entire relief to the patient for the time being. After this operation the abdominal walls returned to a normal level. Upon careful examination after paracentesis, we could find no evidence of disease of the heart, liver, spleen, or kidneys, neither was there any tumor to be discovered by means of deep pressure over the abdomen. In about three weeks a subsequent tapping was performed, obtaining about the same quantity of fluid. The patient has undergone this operation on an average of once every three weeks, each time having from two to three gallons of fluid of the same character withdrawn. He has been tapped in all forty-nine times, the aggregate amount of fluid removed from his abdominal cavity being 976 pints.

The fluid is strongly alkalin, odorless, of salty taste, specific gravity ranging from 1008 to 1014, depending

upon the kind of fluid ingested, and diet seems to influence the amount of the accumulation as well as its specific gravity. During the summer when he is indulging in a vegetable diet, the fluid accumulates very rapidly and is of lower specific gravity; and in winter, when diet is mostly of foods rich in fats, the opposite condition obtains. Upon standing this fluid undergoes separation imitating milk, the rich fatty elements coming to the top like cream. Chemic analysis proves it to consist of many of the same elements as chyle, and the microscope shows an abundance of fat globules and granules of different, but minute sizes, in suspension. There are also numbers of crystals of what appears to be salts of the ammoniophosphates. No leucocytes, blood-corpuscles or epithelial cells were to be found.

The patient is at this time in excellent health. His appetite is good, there is no dyspepsia or pain, the bowels are regular, and but for the inconvenience occasioned by the enormous distention of the abdomen, and edema of the lower extremities, which disappears at once on tapping, he is apparently well.

I have used an ordinary trocar and cannula for this operation, and have always observed the strictest antiseptic precautions; as a consequence, he has never suffered the least inconvenience from it, the punctures invariably healing rapidly. As to location of the punctures, I have not observed any particular rule, except to avoid tapping above the umbilicus, or in the extreme groin, taking care to see that the bladder is empty.

This case is no doubt of a chylous nature, being of especial interest only on account of its rarity, the long duration of the disease, and the continued good health of the patient. The exact pathologic lesion is obscure and will probably never be revealed short of an autopsy, but the author believes there exists that variety of ascites which is due to an effusion of chyle into the peritoneal cavity, resulting from some obstruction situated in the lymphatic vessels, lymphatic glands, or the thoracic duct. The chyle finds its way into the peritoneal cavity by the rupture of the lymphatic vessels or transudation through them, the nutrition of the body being carried on by anastomosis. In a fairly careful search of literature, I have been able to find only eight recorded cases of chylous ascites.

MEDICAL PROGRESS.

The Question of Allowing a Woman Who Has an Eruptive Fever to Nurse Her Child.—ROGER (*Med. Week*, September 3, 1897), from statistics kept at one of the Isolation Hospitals in Paris, answers the above question in the affirmative. Of quite a large number of new-born infants breast-fed by mothers who suffered at the time from either measles or scarlet fever, none contracted scarlet fever, and only two measles, and in both of them the disease was of a mild type. So that one need not feel any uneasiness in allowing an infant to continue at the breast of the mother who manifests the symptoms of one of these diseases. This immunity is explained by Roger on the supposition that the children are rendered immune to the disease, by ingesting the toxins or attenuated germs in the milk.

Ultimate Results of Operations for Hernia.—In the *Rev. Med. de la Suisse Rom.*, July 20, 1897, there is a *résumé* by TAILENS of 324 cases of hernia operated upon in the hospital service of Roux, which affords opportunity for fruitful study, the more so, that only cases which have gone over two years since the operation and which have been personally traced are included in the tables. These herniæ were 288 inguinal, 22 femoral, and 14 umbilical, and the recurrences were respectively 16.7, 27.3, and 0 per cent. Taking the inguinal cases alone the influence of age was most apparent, the recurrences for each decade of life being 5, 10, 15, 25, and 32 per cent., the latter including all cases over forty years of age.

Two methods of operations were employed, *viz.*, that of Bassini fifty-three times, and simple suture of the pillars either in one or two layers; the operation of Ferrari, in 235 cases. Cases operated upon by the former method recurred to the extent of 39 per cent., while following the latter only 12 per cent. relapsed. This is directly opposed to the experience of some American surgeons.

The cases which healed primarily did better than those which healed by granulation, the figures being respectively 15 and 22 per cent. Atrophy of the testicle occurred in 4 per cent. of the Ferrari operations, and in 7 per cent. of the Bassini's. An attempt was made to ascertain the virility of those having double herniæ, but the replies were unsatisfactory partly because many of the men were not married, an also because it could not be definitely shown that they were the fathers of the children attributed to them. The author gained the impression, however, that these men were less fertile than normal.

The Rapid Estimation of Uric Acid in Urine. — BARTLEY (*Brooklyn Med. Jour.*, August, 1897), has devised a method of estimating the amount of uric acid in the urine which may be completed in about half an hour. The solutions required are: (1) A 1-50 silver nitrate solution. (2) A mixture containing 8 grams of crystalized magnesium sulphate and 12 grams of ammonium chlorid in 100 c.c. of aqua ammoniæ (U.S.P.). (3) A solution of ammonium sulphohydrate of such a strength that its color is nearly that of the urine. Fifty cubic centimeters of the urine are poured into a beaker, with 5 c.c. of the magnesium fluid, and the whole is warmed over a water bath to prevent the precipitation of the xanthin bodies by the silver.

The silver solution is run into the warm mixture from a burette. From time to time a drop is removed from the beaker by means of a dropper over whose end a piece of absorbent cotton has been tightly wound, thus acting as a filter. After removal of the cotton the drop of the solution is brought into contact with a drop of the ammonium sulphohydrate solution on a white slab or a piece of glass placed over white paper. If a dark ring is observed at the line of contact of the two fluids, there is an excess of silver nitrate, and when this point is reached no more silver is added. Each cubic centimeter of silver

solution used, precipitates 0.00336 grams of uric acid. This factor multiplied by the number of cubic centimeters used gives the uric acid in the 50 c.c. of urine. To obtain the number of grains in an ounce, multiply this result by 9.12. Fifty cubic centimeters of urine require usually from 6 to 10 c.c. of the silver solution to precipitate all of the acid present; if more than 12 c.c. are required, it is better to dilute the urine with an equal amount of water before taking the final reading. If albumen is present, it must be precipitated by acetic acid and boiling before the uric-acid test is made. If there is a sediment of uric acid or urates this must be dissolved by heat, with or without the addition of sodic hydrate, and diluted with an equal quantity of water before the urine is tested.

The amount of xanthin may be determined by testing one portion of the urine warm and another cold; the difference in amount of the silver solution required in the two instances being that necessary for the precipitation of the xanthin. One cubic centimeter of the silver solution will precipitate 0.00158 grams of xanthin.

On the Occurrence of Nasopharyngeal Adenoids. — Arrowsmith (*N. Y. Med. Jour.*, August 28, 1897) reports in tabular form 701 cases of nasopharyngeal adenoids observed in 2000 dispensary patients. Contrary to the experience of many Continental observers, in not a single one of these 701 cases was there the slightest evidence on gross inspection of a tuberculous tendency. In twelve consecutive unselected cases, histologic, bacteriologic, and inoculation examinations, were absolutely negative. Of 255 operations, 204 were performed under general anesthesia, which is greatly to be recommended in young subjects as it lessens nervous shock, saves time, and above all else enables the operator to perform his work with a greater thoroughness than is otherwise possible.

Dyspepsia in Children.—Magniaux (*La Presse Médicale*, May 19, 1897), says that dyspepsia is very common in childhood but is frequently overlooked; its victims being treated for anemia, beginning tuberculosis, etc. In consequence, iron, creosote, quinin, and wine, all which are irritants of the mucous membrane of the stomach, are given often with unpleasant results. The author having examined eleven children presenting the symptoms of dyspepsia draws the following conclusions: all were badly nourished during the first years of life; eight were bottle-fed; three were allowed a mixed milk diet; and all were rachitic to a variable degree.

A dyspeptic child may be abnormally thin, or large and fat, the two types representing only two successive stages of dyspepsia. In all of these cases the stomach resonance extended down to, or even below the umbilicus. There was always excessive thirst, and usually loss of appetite, though in two of the children the appetite was abnormally great. Constipation was frequent, often alternating with diarrhea. Nausea, vomiting, and heart-burn, were frequently observed. At times the gastralgia was so marked that it might easily be thought to be due to ulcer of the stomach. Headache and night terrors were common.

Hydrochloric acid was usually found to be in excess, although it was entirely absent in certain cases, and at times it was normal in amount. As a general rule alteration in the gastric juice played a secondary part while muscular atony was the most important feature of the disease.

Treatment was for the most part dietetic. Medicines were prescribed in only four of the eleven cases, and consisted of bicarbonate of soda, powdered nux vomica, and hydrochloric acid. In all cases the treatment employed had but one object, that of permitting the overworked stomach to rest as much as possible. This was accomplished by reducing the number of meals, by establishing their regularity, their character, the fine division of the food, and the regulation of the amount of liquid. The results obtained were very satisfactory.

Bichlorid Catgut Better Than Kangaroo Tendon.—Borden (*New York Med. Jour.*, September 18, 1897), as a result of his personal experiments makes the statement that catgut boiled in a 1-to-500 solution of bichlorid of mercury in alcohol over a water bath for one and one-half hours is cheaper, stronger, more regular in size and will last longer in the tissues than kangaroo tendon. In a skin wound sutured partly with kangaroo tendon and partly with heat-sterilized catgut, it was found at the end of five days that some of the sutures of tendon were cut quite through by the leucocytes, while the catgut sutures were all divided by their action. This wound healed aseptically. In another wound which suppurated catgut and tendon, both of which had been steeped in bichlorid solution, were used. At the end of four days a microscopic examination was made, and it was discovered that the action of the leucocytes had penetrated the tendon to its center, while the bichlorid catgut, in this case No. 8, was eaten only half way through. The superiority of the catgut was thus clearly shown.

Borden prepares his catgut in the following manner: Coils of gut are placed in clean Petri dishes, or short strands in long glass tubes the ends of which are stopped with cotton, and kept for three hours in a dry sterilizer which is slowly raised from 100° to 140° C. The gut is then removed with sterilized forceps to a sterilized pint fruit jar, which contains the alcoholic solution of bichlorid of mercury, 1 to 500. In this it is slowly boiled on a water bath for one and one-half hours. It is kept in the bichlorid solution until wanted.

Borden now uses catgut prepared in this way in cases in which he would formerly have trusted only to kangaroo tendon, or, indeed, in which he would have thought the use of silver wire or silkworm gut indispensable. He has had the best of results from its use in hernia, and in appendicitis with suppuration, when it was possible to close the wound only partially, deep sutures of this catgut kept the edges in apposition for a sufficient length of time, and suppuration did not extend to the stitches, as would have been the case if silkworm gut had been employed. The most serviceable sizes are Nos. 1 and 2 for fine sutures and ligatures, and Nos. 8 and 9 when strength is required.

The Country Slaughter-House as a Factor in the Spread of Disease.—In the *Med. and Surg. Reporter*, September 11, 1897, STILES, one of the Zoologists of the United States Department of Agriculture, points out how the country slaughter-house is a factor in the spread of disease. Whether the animals used for food are killed by the farmers or by the butchers in their own slaughter-houses, the offal is almost always fed to hogs. If the slaughter-houses are permanent, they are usually infested by rats, which are frequently eaten by hogs. As a result of these practises, many hogs become infected with trichinæ. Of seventy-two rats taken from slaughter-houses, meat-shops, and packing-houses, fifty-four per cent. were found to have the disease, while of seventy-five rats from barns, feed-stores, etc., only three per cent. were infected. The probabilities are, therefore, if a hog eats a rat at a slaughter-house it will contract trichinosis. It is not to be expected that hogs which eat offal will escape infection any more than will the rats, so it is no cause for surprise that from one to two per cent. of the hogs at large abattoirs are trichinous, for in some localities from one to four per cent. of the hogs are offal fed. The offal of hogs ought never to be fed to these animals. There is no sanitary objection to feeding them the offal of healthy cattle and sheep, but cattle affected with tuberculosis and other diseases may transmit them to hogs, so that the practice ought to be abandoned altogether, and all the offal rendered. If the slaughter-houses were located near together in every locality, instead of being as at present far apart, this could easily be done. As a further precaution the houses should be kept free from rats, by the use of traps, not poison, as this drives them away.

A Supposed Case of Bismuth Poisoning.—MAXSON (*Ann. of Gyn. and Pediat.*, July, 1897) describes an instance of poisoning by bismuth. Fifteen grains of the subnitrate was given every two hours to each of a pair of twins three weeks old, to allay diarrhea. The children became dark-colored, sleepy, and the breath had a garlicky odor. The bismuth passed from the bowels unchanged in color. The administration of the medicine was discontinued and the symptoms of poisoning quickly disappeared. Two weeks later, owing to a recurrence of the diarrhea, one of the children was again given the same preparation of bismuth, and the symptoms again developed.

Some Facts About the Origin of Malaria.—BATTEN (*Jour. Amer. Med. Ass'n*, August 14, 1897) denies that the poison of malaria enters the system wholly by way of the stomach, and in support of the theory that an entrance may also be effected through the respiratory tract he mentions his experience on the vessel *Valley City* during 1864–5. The ship was cruising along the coast of North Carolina, and although all the water used on board, either for drinking or cooking purposes, was boiled and filtered, yet the number of cases of malaria invariably increased whenever a long stay was made in any river. Again, in the Western States and in Pennsylvania, malarial fever has actually been ploughed out of existence, those who first turned the soil suffering the most from its effects. Was it in the food or water of these early settlers that the *plasmodium malariæ* was contained, or was it in the air they breathed?

THERAPEUTIC NOTES.

Proper Use of Colchicum in Gout.—SCHULZ (*Med. Week.*, September 3, 1897) believes that the failures in the use of colchicum in gout are due to two causes, *viz.*, the employment of the drug at a period of the disease when it is inefficient, and secondly, to the use of excessive doses. It is especially indicated in cases in which there is pain in the joints, fever, and copious perspiration, quick breathing, and a full pulse. The dose should be small, from 20 to 40 drops daily of a mixture of the tincture of colchicum seeds and alcohol in the proportion of one part to ten.

Acute Pulmonary Affections Treated by Warm Baths.—In the *Centralbl. für Innere Med.*, July 10, 1897, there is an abstract of an article by VERDY on the treatment of acute affections of the lungs by warm baths. The baths should be given at from 36 to 38° C. (97 to 100° F.) and should last during ten minutes, the usual precautions against congestion of the brain being carried out. From two to three baths are given daily according to the necessities of the case. After a bath there is a quiet, restful sleep, while the respiration and pulse become less frequent and more regular, and expectoration is facilitated. Upon awaking, the patient is delighted to find the pain less severe, and in the case of children the playthings are asked for, and the appetite is almost immediately restored. In some cases mustard is added to the baths.

Practical Points in the Treatment of Chancres.—FOURNIER (*La Presse Med.*, July 7, 1897) has an excellent paper upon the treatment of chancres, from which the following practical points are taken: (1) Forbid sexual intercourse. (2) Forbid a stimulating diet. (3) Counsel moderation in exercise. (4) Prescribe frequent warm baths, local and general, and a simple ointment for local application. Irritating substances such as alum, ferric chlorid, carbolic acid, etc., should never be used. Iodoform, though an excellent application, had better be dispensed with on account of its odor. Nitrate of silver is much abused, and should never be used except to stimulate healing in chancres which remain stubbornly covered with a crust; or upon indolent ulcers or exuberant granulations. In these cases the application ought not to be repeated oftener than every five days. If the chancre is at the meatus, the same rules of treatment apply, but they are to be carried out with the greatest pains on account of the tendency to inflammation of a chancre in this situation. If the chancre is situated within the urethra, aside from the local and general baths and the administration of diluents, nothing is to be done, as in such cases the introduction of foreign substances, either fluid or solid, within the urethra, only aggravates the trouble.

The Medical News.

A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

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SATURDAY, OCTOBER 9, 1897.

MERCANTILISM VS. MEDICINE.

ABOUT fourteen years ago President White of Cornell University published an article sharply calling the attention of thinking men to the fact that the relations of the business and the professional worlds were rapidly being reversed; that the varied opportunities for making money in different mercantile pursuits in this great commercial nation of ours were draining the brightest minds from the learned professions. He explained the fact by showing how much more wealth could be amassed by the exertion of a certain amount of brain power in a mercantile pursuit than by the exercise of equal brain power in one of the professions.

The church, the bar, and medicine have all equally suffered by this change. And not only have many brilliant minds been drawn away from our profession; more disastrous still, the ease with which a person can become legally qualified to practice medicine in almost all parts of this country has opened the floodgates of mediocrity and over-supply. Indeed, the mercantile spirit has helped in more ways than one to cause an over-supply of physicians, many of whom are necessarily of ordinary ability. Few cities of more than 100,000 inhabitants in this country are without a fairly well-equipped medical college, which takes the raw material and, in an incredibly short time, turns out a machine-made product of medium attainment—with exceptions of course—but all of them warranted to wear awhile and compete in the race. The mercantile spirit is at the bottom of this condition. The professors and teachers expect an augmentation of both reputation and practice to accrue from the nature of the position occupied. If the size of the school increases, each receives a gradually increasing salary. Of course some of the instructors, the writer, and a few other sainted ones attend at the free dispensary for glory and love of study; but none the less, every one of the faculty is blindly but laboriously adding complication to complication in the problem which menaces our profession.

This over-supply of men of but average ability has produced the same business conditions that exist in commercial life—that is, the competition which fifty years ago served as a wholesome stimulus has to-day become a deadly struggle. The fight was on in the trading world some years before we felt it keenly in the professional, so that business men are necessarily in advance of us, both in theory and in practice.

The time has been when single-handed effort brought its just and proportionate reward, but the American system of individualism has bred such a ruinous competition that far-seeing men have been driven to combine. A late writer, Otis Kendall Stuart, himself a large manufacturer, demonstrates conclusively that to all thinking men the logical step in business is the foundation of a trust. The man nowadays who attempts to struggle along alone is forced to the wall by a multitude of rivals. The only logical resource is to combine individual strength with that of his competitors—the trust thus formed being to the practical advantage of all concerned, reducing expenses to the lowest possible limit and maintaining profits at the highest. We of the medical profession are now face to face with the question whether we shall not be driven to the same methods in coping with these conditions. We are practically still working upon the system of individualism, with at the same time an indistinct, albeit semi-blind, reaching out after the new methods of the business fraternity. The lodges, the great public hospitals, the dispensaries, and the sharp competition are a quartet

that is steadily and surely forcing down prices to the starvation point. Cannot some practical remedy for this condition be found in the formation of a trust on the part of the profession, a good common-sense working trust or union that shall have some solidarity of purpose and some cohesion among its members?

THE LUETGERT CASE AND EXPERT TESTIMONY.

THE battle royal now on in Chicago, in which the experts for the prosecution assert their scientific belief that every particle of bone found in or about the now famous sausage-vat belonged to a human adult female, bids fair to be enrolled as one of the most monstrous exhibitions of the century. The experts for the defense, no less than their opponents, have thus far demonstrated the utter fallibility of testimony called expert. Indeed, the experts on both sides have made so many contradictory and impertinent statements about bones in general, especially about phalanges, ribs, sesamoids, femurs, and temporals, that the profession, the public, and especially the jurors, are so confused that, if any consideration is to be given to this feature of the evidence, it will result only in uncertainty and doubt.

Furthermore, it will not be surprising if all concerned—judges, lawyers, and jurors—lose all respect for expert testimony. Professor Os Calcis swears that a bone he now holds in his hand is that of a woman, while Professor Trapezium affirms that the same bone belongs to the hog family. How ungallant of you, Professor Trapezium! But never mind, gentlemen, you have illustrated what has been demonstrated over and over again in New York—that it is perfectly absurd to go on hiring so-called experts, as the courts are doing in all cases of a criminal nature. Too long has this sad condition been a reproach and a shameful stigma not only upon the courts of justice, but also upon the medical profession. I will venture to say now that every man of the "twelve good and true" sitting in judgment in this case has concluded that a just verdict can be reached only by entirely eliminating the testimony of the experts. Their verdict will certainly brand the one or the other set of experts as veritable humbugs, for certainly those for the defense have thus far contradicted every point depended upon by the State for a conviction.

Astounding as the expert testimony has been in this case, it is only equaled by the brazenness of the opposing counsels. The medical witness must answer "yes" or "no" or be ridiculed beyond the limit of toleration. Pleading lawyers and cross-examiners never respect a medical witness; confusion worse confounded in a few moments takes the place of the direct and forceful statements the medical witness wishes to make. The expert may be perfectly correct in saying that a given bone is a human femur, but before the opposing counsel gets through with him he is unable to swear to the identity of his own nose. He is simply to be confused, in order the more certainly to confuse the jury.

These astonishing exhibitions in courts of justice will but hasten the day when a decided revolution shall be inaugurated in the method of selection of medical experts and the giving of medical expert testimony. Certainly such a witness is justly made light of in many cases; he is amusing at times, but he winks the other eye, for he has a fee.

Appalling as all the contradictory testimony has been in this case, one fact will stand after all else has vanished, and that is, sufficient experiments in the boiling of bodies have been made to suffice for all time. The State boils a body and finds that it entirely dissolves in a certain specified time; the defense boils two to their one, with entirely opposite results. A human body, male or female, thrown into a vat before life is extinct, and subjected to prolonged boiling in a caustic solution takes on changes more or less rapidly in proportion to the strength of the caustic and the temperature of the solution. The experts in this case have agreed, disagreed, and even flatly contradicted their brethren of the same side on the above points.

The scientific mind of the anatomist has been placed in a peculiar position. The gray matter of his left hemisphere must be having a terrible time trying to convince the gray matter of his right hemisphere that a contemptible sesamoid bone has been the initial cause of the femur of a dog refusing to be recognized as the femur of a female adult. The osteologist is certain, when upon the witness-stand, that the femur he holds in his hand, the largest and strongest of the bones, is that of a human; you cannot fool him. He goes still further; he testifies that it at one time formed part of the bony frame-

work of a female human. Not satisfied with this, thinking he has routed the prosecuting attorney, he is confident that that particular female human who owned that femur in life was five feet four inches in height. He arrives at this latter conclusion by the length of the femur. Oh, God of mathematics, you have been made sponsor of a most egregious piece of logic! The expert steps down, smiles with satisfaction to himself until rebuttal testimony brings out positive proof that the aforesaid femur belonged to the bony framework of a gorilla, six feet six inches in height.

Even the poor little rib has been used in this case to puzzle court and jury. Not since the exsection of a rib from Adam in the Garden of Eden has it played so important a part as when flaunted in the court-room last week. I am not aware which rib was found, but the peculiarities of the first, second, tenth, eleventh, and twelfth ribs would not help the case in any manner. As if the case of the State had no leg to stand on, the prosecuting attorney promptly supplies a phalanx or two.

Weak spots have shown themselves in the case for the State. For instance, no testimony has been adduced to show that any one piece of bone fitted any other fragment. Corresponding bones would go far to prove whether the pieces belonged to one body or not, human or animal. Two femora, two temporals, several ribs, or a few inches of the spinal column would assist to clinch the case. To determine age from bones is almost impossible; the long bones and those especially, past the period of ossification would help in this direction. In any event, positive opinions must be guarded. Stature may be approximately stated by measurement of a long bone, but to state positively the probable nature and connection of an isolated bone is absurd.

The question of identification naturally arises, the defendant claiming that his wife left home; the State contends that the finding of finger-rings and bones in and about the vat points to the fact that the defendant's wife was placed therein and destroyed. Admitting this, there is not a particle of evidence to prove in what manner the wife of the defendant came to her death. It certainly is not a capital offence to place a dead body in a vat and destroy it. Whether the body in this case, admitting that a human adult female body was placed in the vat, found its way therein before or after life was extinct is a question which cannot be solved by chemic or pathologic research; circumstantial evidence alone can decide this contention in the case.

The lessons derived from the Luetgert case point to a revolution in the methods of selecting and giving expert medical evidence. The medical profession should rise and demand the change before the ridicule heaped upon medical men brands them, when on the witness-stand, as blockheads.

JUSTIN HEROLD, M.D.

ECHOES AND NEWS.

Swallowed False Teeth. — The death of a man, aged sixty-eight, at East Hampton, Mass., was caused by swallowing two false teeth during sleep.

Fined for Illegal Practice.—A colored man employed in a drug-store in Washington, D. C., was recently fined $50 in a police court for illegally practising medicine.

Prison Congress Postponed.—On account of the yellow fever the date of the Annual Prison Congress to be held at Galveston, Texas, has been postponed to December 2d to 6th, inclusive.

Influenza May Come.—The medical press of Europe is warning the public against a probable recurrence of influenza, which has been raging for months in a severe form in the district of Merv, Turkistan.

Appointment of Dr. Bates.—President McKinley has appointed Medical-director Newton L. Bates, Surgeon-general of the Navy Department, to succeed Surgeon-general J. Rufus Tryon of New York.

Vaccination Laws in England.—Vaccination laws are not enforced in England. At Norwich, with a population of over 100,000, the vaccination-officer's fees this year amounted to about $40. He receives fifty cents for each case.

Bombay Again Stricken.—Sixty deaths from bubonic plague occurred in Bombay during the last week in September. The disease has reappeared in Kurrachee, and is gradually spreading. It is said that the government regards the situation as serious.

Typhoid Fever Attacks the Turks.—The news comes from Constantinople that typhoid fever is ravaging the Turkish troops in Thessaly. Six thousand men have already been invalided home, and four thousand others are awaiting transportation back to Turkey.

Typhoid Epidemic in Kent (England).—According to the *New York Times* there is an alarming outbreak of typhoid fever at Maidstone, Kent, due to the pollution of

water by drainage from a hop-pickers' encampment. Over 1300 cases have been reported.

Medal for Dr. Recamier.—The news comes from Paris that Dr. Recamier has been presented with one of the silver medals sent by the Czar to be distributed among those who distinguished themselves at the charity bazaar fire by saving others from perishing in the flames.

Professor Adami to Lecture at the New York University.—Professor Adami of McGill University has accepted the invitation of the New York University Medical College to deliver a course of lectures on general pathology. The course begins Friday morning, October 8th.

Obituary.—We regret to announce the death on September 20th of Dr. G. D. Ricketts at Proctorville, Ohio. He leaves a widow, one daughter, Mrs. G. D. Bush, and three sons, Edwin S., Merrill, and Joseph. All of the sons are physicians, practising in Cincinnati, Ohio.

The Restrictions of Medical Charities. — Dr. Stephen Smith, who was recently elected President of the Board of Charities of New York City, is reported has having said that hereafter not one person who is able to pay for medical aid will receive free treatment at any of the city institutions.

Yellow-Fever News.—It is reported that the yellow-fever epidemic is spreading in New Orleans. Many new cases have developed, five of which appeared in one of the fashionable avenues of the city. The mortality has decreased from fifteen to twelve per cent. No general alarm is as yet felt.

Fatal Railroad Crossing.—The wife of Dr. R. C. Gray of Springfield, Long Island, was instantly killed by a train at that place September 29th. The carriage in which she was driving with a friend and two children was demolished at a railroad crossing. The others were seriously injured but may recover.

Appointments Abroad.—Dr. T. W. Engelmann, Professor of the Medical Faculty of Utrecht, has been appointed ordinary professor of physiology, vice Professor du Bois-Reymond, deceased. Dr. Leopold Meyer, docent, has been appointed professor of obstetrics and gynecology at Copenhagen, vice Professor Stadfelt, deceased.

American Jubilee Fund Endows Hospital Beds. — Guy's Hospital (London) has received a donation of $5000 from the Committee of the American Victoria Jubilee Fund to endow in perpetuity a "Queen Victoria Bed." The London Hospital and the Charing Cross Hospital have each received a similar donation.

Experimental Hygiene in the Argentine Republic.—It is reported that a laboratory, similar to the Instituto d'Igiene Sperimentale founded by Sanarelli in Montevideo, is to be opened in Buenos Ayres. It will be under the direction of Professor Ferruccio Mercanti, the sub-director of the laboratory over which Professor Sanarelli presides.

Bogus Doctor Convicted.—In a Brooklyn police court a man named Siegfried Reubel has been convicted of practising medicine illegally. This is the individual who attempted to restore the sight of a little girl by placing about her head an iron band, which he tightened at intervals by means of thumb-screws with which the instrument was provided.

Death of Dr. Samuel Craig.—Dr. Samuel Craig died recently at the home of his parents in Brooklyn. During last year, while on duty at the Manhattan Hospital, Ward's Island, he contracted typhoid fever, followed by pneumonia, which speedily developed into phthisis, which latter disease ultimately caused his death. He was twenty-six years of age.

Veterinary College Open to Women.—The New York College of Veterinary Surgeons, the fall session of which began last week, has for the first time opened its doors to women, and one has already matriculated. The Board of Regents of the State University has recently placed the requirements for entering a veterinary college upon the same plane as those for entering a medical college.

Alcoholic Selection.—In a recent work, "The Present Evolution of Man," by Mr. G. Archdall Reid, an English writer, the theory is advanced that intemperance is an important factor in the elimination of the unfit, and in the consequent progress of the race, inasmuch as it kills off those persons who have an undue craving for alcohol. He calls this process of elimination "alcoholic selection."

Typhoid Fever Near Kingston, N. Y.—Many cases of typhoid fever are reported from various towns which lie near Esopus Creek, in Ulster County, N. Y. This stream, which is a popular fishing ground, has its source at the quarries at Malden, and its outlet at Kingston Point. It is claimed that the disease is caused by the pollution of the water by the Kingston sewer which empties into the creek.

Body Hidden in the Cargo.—The news comes from San Francisco that the dead body of a Chinaman was found stowed away in the hold of the ship "America," which recently arrived at that port from Prince William Sound with a cargo of salmon. It is supposed that the body was hidden there by other Chinamen in order to avoid a burial at sea. The appearance of the body indicated that the man had been dead for a week.

Honorary Degrees Conferred.—At the recent meeting of the British Medical Association in Montreal, McGill University announced that it had conferred honorary degrees upon the following: Lord Lister, Sir Walter Foster, Sir William Turner, Dr. H. Barnes, Dr. Michael Foster, Dr. Gaskell, Mr. Christopher Heath, Dr. Alexander Macalister, Dr. Saundby, and Mr. Wheelhouse, all of England, and Professor Richet of France.

Remarkable Recovery from Snake-bite.—The sting of the double-horned viper is said to be invariably fatal, yet a case is reported from Opobo, West Africa, where a man survived the bite of one of these reptiles. He was stung just above the right ankle, and within an hour the leg was three times its natural size. Iodin and potassium were

injected into the wound, and the man recovered after a desperate illness and some days of delirium.

Dr. Bermingham Appeals.—The local Board of Health of Liberty, Sullivan County, N. Y., refused Dr. Edward J. Bermingham permission to erect at that place a sanatorium for the care of consumptives. Dr. Bermingham appealed to the State Board of Health on the ground that the local officials have no authority to prevent the establishment of a hospital for the care of the sick. The question having been referred to Attorney-general Hancock, he sustained Dr. Bermingham's position.

Memorial to Marcello Malpighi.—The news comes from Rome that a monument to Marcello Malpighi, the great physician and biologist, has recently been unveiled in his native town, Crevalocore, in Italy. The monument is surmounted by a statue of Malpighi, sitting in profound meditation, book in hand, and is the work of the sculptor, Enrico Barberi. Among those present at the unveiling was Professor Kolliker of Würzburg, who spoke of Malpighi as "the founder of embryology."

Instantaneous Skiagraphy.—It is said in Paris that an important improvement in skiagraphy, as applied to medicine, has been brought before the Academy of Sciences of that city by M. Porche. It is proposed to make use of a fluorescent screen and to photograph the shadow on the screen. An extremely sensitive plate is required, and this plate must be protected from all other rays emanating from the Crookes' tube, except those which actuate the fluorescent screen.

The Astoria Water-Supply.—The Grand Jury of Queens County, L. I., which has been investigating the complaints against the water-supply of Astoria, reports that it is insufficient and sometimes unfit for use. It was recommended that larger mains be used to increase the supply. The report furthermore states that the Grand Jury deplores the lack of harmony in the different departments of Long Island City, which renders any concerted action for the benefit of the people impossible.

Pulmonary Phthisis in Europe.—At the recent meeting of the International Medical Congress at Moscow, Professor von Leyden read a paper on the important subject of the treatment of pulmonary phthisis in special establishments. He called attention to the enormously large number of persons who perish from this disease, and said that in Germany there are 1,200,000 consumptives, of whom 180,000 die every year, and estimated that the annual mortality from phthisis in Europe is upward of 1,000,000 persons.

Insanity in Prussia.—In connection with the increase of insanity in England, mentioned in an article in the last issue of THE MEDICAL NEWS, it is said that a similar, if not a worse, condition of affairs exists in Prussia, where the insane asylums are not large enough to accommodate those who require institutional care. In 1871 the total number of lunatics in Prussia was 55,063; in 1880 it had risen to 66,345, while in 1896 the number reached 82,850. It is interesting to note that more men than women are affected.

Hydrophobia in Scranton, Pa.—The death of a ten-year-old boy from hydrophobia is reported at Scranton, Pa. The boy was bitten by a rabid dog sometime last March. During delirium the boy's teeth grazed his father's finger. It was antiseptically treated at the time and no further attention paid to it. The hand and arm now show considerable swelling and are very painful, and the man has been advised to come to New York to undergo the Pasteur treatment. It is said that the dog bit seven persons, and the boy above mentioned is the second who has died.

Health Reports.—The following statistics concerning cholera, yellow fever, smallpox, and plague, have been received in the office of the United States Marine Hospital Service during the week ending October 2, 1897:

YELLOW FEVER—UNITED STATES.

		Cases.	Deaths.
Mobile, Ala.	September 24 to October 1	40	6
New Orleans, La.	September 25 to October 1	160	15
Biloxi, Miss.	September 25 to October 1	117	3
Edwards, "	September 25 to October 1	126	4
McHenry, "	September 30 to October 1	4	..
Ocean Springs, "	September 25 to October 1	5	1
Perkinston, "	September 10.	1	..
Scranton, "	September 26–29.	11	3

YELLOW FEVER—FOREIGN.

Rio de Janeiro, Brazil.	August 21-28.	1	..
Cardenas, Cuba.	September 4-11.	..	1
Cienfuegos, "	September 5-19.	..	16
Havana, "	September 16-23.	..	23
Matanzas, "	September 8-22.	..	3
Panama, U. S. Col.	September 10-13.	2	..
Bombay, India.	August 17-31.	..	193
Calcutta, "	August 7-21.	..	9
Madras, "	August 21-27.	..	7
Singapore, "	July 1-31.	..	1
Kanagawa, Japan.	August 24 to September 2.	1	1
Osaka and Hiogo, "	August 21-28.	1	..
Tokio, "	August 24 to September 2.	14	5

PLAGUE—FOREIGN.

Bombay, India.	August 17-4.	..	13

SMALLPOX—UNITED STATES.

Birmingham, Ala.	September 18-25.	2	..

SMALLPOX—FOREIGN.

Athens, Greece.	July 1-31.	4	..
Glasgow, Scotland.	September 4-11.	..	1
Alexandria, Egypt.	July 23 to August 12.	..	4
Havana, Cuba.	September 16-23.	..	1
Rio de Janerio, Brazil.	August 21-28.	9	..
Brussels, Belgium.	August 28 to September 4.	..	1
Cairo, Egypt.	July 23 to August 12.	..	8
Hong Kong, China.	August 1-14.	..	3
Paris, France.	August 29 to September 11	..	4
Madrid, Spain.	September 1-7.	..	2
Warsaw, Russia.	August 28 to September 11	..	15
St. Petersburg, Russia.	September 4-11.	4	..
Madras, India.	August 21-27.	..	3
Calcutta, India.	August 14-21.	..	1
Bombay, India.	August 24-31.	..	1
Prague, Bohemia.	September 4-11.	2	..

American Women Students at University of Zurich.—A society has been formed at Zurich, Switzerland, by Amer-

ican women who are studying for a doctorate at that place, and a circular has been issued containing information for those who intend to study in Europe. Among other things it states that no woman should go to Zurich with the immediate intention of university-study, unless she has not only a reading but a speaking knowledge of German, and furthermore, that Zurich is not the place to acquire this knowledge because of the dialect spoken there and because of the number of foreigners in the town.

Disinfection of Mails from Infected Localities.—There are different ways of disinfecting mail matter, but in the New York Post-office it is done in the following manner: A bag of letters upon being received at the quarantine station is turned over to an employee, who, with his hands carefully gloved, drops them one by one into the chute of a machine which punches a circular hole, about one-sixteenth of an inch in diameter, through each. As they emerge from the punching-machine the letters fall into a basket from which they are emptied into a huge circular tank inside of which is a cage of steel wire. This cage revolves rapidly by means of electricity, and for an hour the letters are shuffled up and turned about, during which time they are subjected to the fumes of sulphuric acid. When this is finished live steam is turned on, and the cage is again set in motion for a shorter space of time. The letters are then returned to the mail-bag, which has meanwhile been thoroughly fumigated in the steel cage, and are delivered in the usual way.

CORRESPONDENCE.

A HINT TO LIFE-INSURANCE EXAMINERS.

To the Editor of THE MEDICAL NEWS.

DEAR SIR: If an applicant for life insurance on being examined states that he has some eye trouble, and is at the time under the treatment of a specialist, whose address he supplies, would you consider it the duty of the examiner to write to the specialist to ascertain the cause of the eye trouble, or the duty of the medical director of said insurance company? Respectfully,

"E."

MANCHESTER, VA., June 1, 1897.

[The above letter was referred to Dr. E. W. Lambert, Medical Director of the Equitable Life Assurance Society, and the following reply received.]

DR. J. R. GOFFE.

MY DEAR DOCTOR: My answer to such an inquiry would be this: If an applicant came before us and should state that he was under treatment by any specialist, we would expect the applicant to furnish us with a certificate from the specialist as to what he was treating the applicant for, and also all the particulars relating to the case from the standpoint of the specialist. In other words, it is the duty of the applicant to furnish the company with all the facts in regard to his present and past history, and not our business to hunt up and find out what has been the matter with him.

Yours very truly,

E. W. LAMBERT, M.D., Medical Director.

NEW YORK, August 2, 1897.

KEROSENE-OIL POISONING.

To the Editor of THE MEDICAL NEWS.

DEAR SIR: In the issue of THE MEDICAL NEWS of September 18th, I read with interest the report of a case of kerosene-oil poisoning by Dr. G. Edgar Hoffman of Rochester, Indiana, as I had just observed a very similar case in which a boy aged seventeen months swallowed a mouthful of kerosene oil, and strangled severely. The mother ran into my office with the child, so that I saw him within one minute after the ingestion of the oil. I simply inverted the child—not entirely, but so that his head was lower than his body, and face down. I tapped him sharply on the back, which caused the sudden expulsion of air from the lungs and expelled the few drops of oil from the throat. I next applied pressure with my hand over the stomach, and in a very short time had him vomiting nicely. In fact his stomach was entirely emptied in about five minutes. The child became very pale and almost completely unconscious, in which condition he remained for nearly two hours. From this time on he improved quite rapidly and next evening was about as well as usual.

I would not have considered this case of sufficient importance to report had not Dr. Hoffman mentioned the scant literature upon the subject. In connection with this I might mention another case which occurred in my practice about four years ago. I was called in great haste to see a child that had swallowed coal-oil. This did not prove so serious. A dose of zinc sulphate caused immediate vomiting and the child apparently suffered little. There was no strangulation. At the time of the occurrence of my first case I was assured by Dr. J. H. Kinyoun of Centreview, that I need not be greatly alarmed as the oil was not, in itself, very dangerous, and the old doctor related that he himself had once taken nearly half an ordinary glassful of the same oil—kerosene—and never felt the least discomfort from it.

D. D. BARR, M.D.,

PRAIRIE HOME, ILL., September 22, 1897.

OUR BERLIN LETTER.

[From our Special Correspondent.]

THE LEPROSY CONGRESS AND THE ATTENDANCE OF SPECIALISTS—KOCH'S NEW TUBERCULIN AND THE RESULTS IN HIS OWN SERVICE; SOME REASONS FOR THE NON-SUCCESS REPORTED—OTHER SERUMS, PROPHYLACTIC AND CURATIVE, IN THE INFECTIOUS-DISEASE WARDS—THE GERMAN APOTHECARIES' UNION AND THE ADMISSION OF WOMEN.

BERLIN, September 27, 1897.

AS the time approaches for the holding of the Leprosy Congress here, the interest shown in it by specialists becomes more apparent. Though so many congresses have been held during the last two months, this one will not suffer by comparison. It is clear that the practical experts in leprosy—the medical men who are living in actual contact with the disease where it is endemic—and the skin specialists whose writings on the subject have been the generally accepted teaching of the medical world are to meet at last under the most favorable circumstances

for the ventilation of discordant ideas. As is usual in most branches of medicine, the theorists and the practitioners have not been strikingly accordant in the general treatment of the subject. Some little fear was entertained that the French school might not be well represented, but some of the best known specialists have signified their intention of being present. There are to be two representatives of the Turkish government from Constantinople, and other delegates will be present from Turkey in Asia, Roumania, Alexandria, Algiers, the East, and Japan, all men of wide practical experience in dealing with the disease.

So much has been said and written recently on the subject of Koch's new tuberculin, and so much has been of an unfavorable nature, that it occurred to your correspondent that it would be worth while to find out what the present opinion of it is in the infectious wards of the Charité, where Koch's assistants are in charge. I found Professor Brieger, who, during Professor Koch's absence in South Africa, is acting director of the department, very ready to express an opinion on the matter. He knows how much that was unfavorable was said at the Moscow Congress, even by distinguished authorities from Berlin, and regrets that a representative of the Koch Institute was not present to state the other side of the case. Under the circumstances, however, with Professor Koch himself absent, this was impossible.

During the course of a walk through the wards with Professor Brieger I saw a number of patients who at present are under treatment with the new tuberculin. Not by any means are all the patients suffering from tuberculosis considered suitable subjects for the administration of the remedy. When the destructive process in the lung is at all advanced very little can be hoped for from the treatment. Regeneration of lung-tissue cannot be expected, and, besides, infection with other microorganisms has inevitably taken place, and the process is eminently a progressive one. Unfortunately, it is just this class of patients which has been used in testing the new T. R. When all other means were hopeless and the patient seemed doomed anyhow, tuberculin was used as a last resort. The recollection of the unexpected dangers developing under the use of the old tuberculin is too vivid to allow most clinicians to use this in just the class of cases for which it is adapted. According to Koch it is in the subjects in whom the physical signs are scarcely more than suspicious, when there are few, if any, tubercle bacilli in the sputum, but when the febrile reaction after injection of the old tuberculin shows the indubitable presence of a tuberculous process that the new remedy can be depended on to effect a cure. As to the danger for such patients, not a single bad result, when a sluggish tuberculous process has been irritated into acute activity, has occurred in all the cases treated at the Institute. As to the possibility of the presence of any living tubercle bacilli in the new tuberculin, when properly prepared, it is the merest chimera, for, in almost countless cultures made by professors and assistants in the laboratories, it has been demonstrated beyond doubt that these have been thoroughly eliminated. As to the reported non-sterility of certain samples of the new tuberculin which came from the factory at Höchet, this may have been true as regards the presence of certain non-pathogenic germs in the first issues from the factory. Large quantities of the agent were called for at once, and some of the minute precautions so necessary for absolute sterility, especially as regards molds and certain harmless air-germs, may have failed of fulfilment. None of the later products, however, is open to such an objection, unless through careless handling afterward.

Some of the cases in which striking improvement has been noted during the course of injection of the new tuberculin are those of external tuberculosis. Lupus, especially, is soon and favorably affected by the remedy, and the healing goes rapidly on to complete cure. Certain external eye diseases, too, when all other methods of treatment have been tried without success, yield to its influence. In the wards at present there is a patient, about to be dismissed as cured, who is a remarkable example of this. The case was one of multiple tuberculous ulcers of the cornea, which absolutely refused to heal under all manner of treatment at the hands of an experienced ophthalmic surgeon. The cure is absolute.

Such cases are very striking, because the results can be clearly seen. There is no question of auto-suggestion, with seeming improvement in symptoms and temporary arrest of the progress of the disease, only to be followed by inevitable relapse. Cases in which the physical signs have shown that the tuberculous areas in the lungs have become less in size during the course of the injections are not lacking, and this sometimes when the destructive process has been quite advanced. There is a remarkable case under treatment just now, of a well-to-do patient who insisted on receiving the injections, though his was evidently at a stage of the disease not considered suitable for the T.-R. treatment. Injections during several months have been followed by lessening of the physical signs in the lungs, and he has gained fifteen pounds in weight.

As to the serums in use at the Institute, reports are not very encouraging. A tuberculous antitoxic serum has been used without effect, and the impression seems to be that an antitoxin for tuberculosis is impracticable. A streptococcic serum, used in conjunction with tuberculin in cases of mixed infection, did not seem to produce any good result. Generally, the streptococcic serums have been unsatisfactory in their action. Recent work at the Institute has demonstrated that the streptococcus pyogenes and the streptococcus erysipelatosus are the same, but the specific virulence of various forms of the streptococcus for animals, and even for individuals, is so different that the preparation of a curative serum which will give results in any definite case seems a hopeless task as yet. Streptococcic serums for the treatment of carcinoma have not proved successful, and even Petruschky's preparation, which, for a time, at least, seemed to promise amelioration of symptoms and slower progress of the malignant invasion, has not continued to give such results as would encourage further experimentation. Cascarelli's serum

for the treatment of leprosy has been tried in several cases, but absolutely without effect.

At the meeting of the German Apothecaries' Union the other day, the resolution that "women had shown themselves to be capable mentally, as many of them were capable physically, of fulfilling the duties of apothecaries, and so should be admitted as members of the Union," was voted down by a large majority. The fact that it should have been presented at all is significant, for in Germany more than anywhere else at present are what may be called the intellectual rights of woman and the question of her employment on a plane at all equal to that of man a subject of derision. The leaven is evidently at work here also.

OUR PHILADELPHIA LETTER.

[From our Special Correspondent.]

THE SOCIAL SIDE OF THE COMING MEETING OF THE AMERICAN PUBLIC-HEALTH ASSOCIATION—OPENINGS OF THE MEDICAL SCHOOLS—DR. WILLIAM S. CARTER HONORED—DR. GEORGE W. PFROMM—DR. CHARLES W. BURR—VITAL STATISTICS FOR THE WEEK ENDING OCTOBER 2D.

PHILADELPHIA, October 4, 1897.

ARRANGEMENTS for the celebration of the twenty-fifth anniversary of the American Public-Health Association, which meets in this city on the 26th, 27th, 28th, and 29th of this month, have been almost completed by the local committee, of which Dr. Benjamin Lee is chairman, and sufficient progress in the details connected with the work of the gentlemen entrusted with the entertainment of the visitors has been made to indicate that the four hundred expected delegates will be fittingly entertained during their stay in Philadelphia. The headquarters of the Association will be at the Hotel Walton, where daily sessions will be held, and which is admirably adapted to the purpose. In addition to the receptions given the members of the Association by the various scientific and teaching bodies of the city, the Committee of Arrangements has planned visits to many places of interest throughout the city. The United States Government has also placed at the disposal of the delegates one of the revenue vessels stationed at this port, and two steamboats belonging to the Sanatorium Association have been secured by the Committee, whose intention it is to convey the visitors to the Government Quarantine Station some miles below the city, where a day will be spent in inspecting the hospital and disinfecting plant situated there.

The session of 1897–'98 of the Woman's Medical College of Pennsylvania was formally opened on September 29th. The opening exercises took place in the large lecture-room of the college, and were presided over by Dr. Clara Marshall, the Dean of the institution. After Dr. Marshall's usual announcements concerning the arrangements for the ensuing year, Dr. Anna M. Fullerton, Clinical Professor of Gynecology, the lecturer for the occasion, was introduced, who took for her theme, "Methods in the Study of Medicine." From present appearances, the outlook for the college year at the Woman's Medical College is exceedingly gratifying to the friends of this progressive institution.

The opening of the Medical Department of the University of Pennsylvania took place on October 1st. the ushering in of the new term being marked by elaborate exercises, in which a prominent part was taken by the distinguished English prelate, Canon Gore, of Westminster Abbey, who made an address to the class. The changes made in the medical faculty since the last session have not been noteworthy, and the *personnel* of the teaching force remains practically unaltered. The enrolment of students for the present term indicates, as far as it is possible to do at this time, a full attendance in the medical school, in spite of the constantly increasing standard of requirements for admission—a standard which the University has gradually raised, year by year, to its present status.

The introductory lecture to the seventy-third annual course of lectures at the Jefferson Medical College will be delivered by Dr. G. E. de Schweinitz, Professor of Ophthalmology, on the evening of October 4th, in the amphitheater of the Jefferson Medical College Hospital. The exercises will be opened by an address by the Hon. William Potter, the President of the Board of Trustees of the college. The class at Jefferson this year far exceeds the expectation of the authorities of the institution, who naturally anticipated somewhat of a diminution in the number of matriculants, in consequence of the radical changes tending toward the high standard of education which the college demands of its prospective students. The faculty of this institution, its laboratory equipment, and its clinical facilities leave nothing to be desired by the seeker for a school offering every modern method for the study of his chosen profession, under the guidance of teachers whose views are authoritative on the subjects upon which they lecture.

The regular fall and winter term at the Medico-Chirurgical College will commence on October 4th with a registration in every department in excess over that of the preceding year. In addition to the elaborate clinical amphitheater erected by the college during last spring, many other improvements in the buildings have been completed. By a bequest of the late Professor William H. Pancoast, the Pancoast Library, consisting of nearly six thousand volumes of medical works, will be placed at the disposal of the students of the college.

Dr. William S. Carter has resigned his position as Assistant Professor of Comparative Physiology and Demonstrator of Physiology in the Medical Department of the University of Pennsylvania, to accept the Professorship of Physiology at the University of Texas, Galveston. A reception was tendered Dr. Carter by many of his colleagues and friends at the University on the eve of his departure, on September 28th.

Dr. George W. Pfromm has been elected Lecturer on Materia Medica and Therapeutics in the Medico-Chirurgical College, to succeed Dr. William B. Stewart.

Dr. Charles W. Burr delivered an address on "The Remote Results of Injuries on the Nerves" before the Philadelphia Hospital Medical Society, on September 27th.

The number of deaths in this city for the week ending October 2d was 342, a decrease of 10 from those of the preceding week, and a decrease of 59 from the correspond-

ing week of last year. The number of deaths from contagious diseases was 33, or 11 less than those reported last week. Cases of diphtheria numbered 97, with 27 deaths; scarlet fever, 25, with 2 deaths; and enteric fever, 31, with 4 deaths.

TRANSACTIONS OF FOREIGN SOCIETIES.

Paris.

RADICAL CURE OF HERNIA BY INJECTIONS OF THE CHLORID OF ZINC—NATURE AND TREATMENT OF EXOPHTHALMIC GOITER—PAINFUL HYPERTROPHY OF THE BREAST AND ITS CURE BY MASTOPEXY—FRACTURES OF THE PATELLA.

AT the session of the Academy of Medicine, July 6th, LANNELONGUE showed some children upon whom he had practised a *radical cure of hernia, by injections of a ten-per-cent. solution of chlorid of zinc.* Of forty-four children and youths, aged from four months to twenty years, treated in this manner, a perfect cure was obtained in forty-one. One of the failures was the very first patient operated upon, and who was insufficiently injected. A cure followed a repetition of the treatment. The other two were unsuitable, by reason of the size or density of the hernia, for this method of treatment. In seven adult cases, success was obtained five times. The essential points of this method of treatment are to avoid injection into the peritoneal cavity, by pressure of the finger over the internal ring, and to avoid injury of the cord, by isolating it at the moment that the injection is made. Two or three injections are usually required, of ten or twelve drops each, and as the pain is pretty sharp it is better to make them under chloroform narcosis.

ABADIE read a paper upon *the nature and treatment of exophthalmic goiter.* Three theories of its origin have been advanced—the hematic, nervous, and thyreogenous. The last is the most seductive and has been widely accepted. None the less, all surgical attacks upon the gland itself have proved uselessly dangerous. The most rational theory is that the disease is due to permanent excitation of the vasodilators of the cervical sympathetic. The benefit which follows division or resection of the cervical sympathetic between the superior and middle ganglia is proof of the correctness of this theory. In all cases in which such division has been made, the exophthalmus and goiter have decreased. If, later, there is a recurrence of these symptoms, this is doubtless due to a restoration of nerve-fibers. In the resections of a part of the gland, the exaggeration of symptoms which so often follows is apparently due to the irritation of torn nerves, and in exothyreopexy this irritation reaches its maximum, and explains why patients die from an operation which in itself does not appear to be dangerous. This theory of a dilatation of the vessels also explains the formidable hemorrhage which is met with in partial resection of the gland.

The rational treatment, therefore, is section of the cervical sympathetic between the superior and middle ganglia. The inferior branch of the nerve is small, and may be neglected. If there is any doubt as to the diagnosis, before resorting to a surgical operation the patient should be put on the thyroid extract for a few days. If there is improvement the proof is conclusive that the goiter is an atrophic one, and the medication is to be continued until a cure is obtained. If the goiter is truly exophthalmic, the symptoms will be aggravated, and the operation referred to should be performed.

POUSSON spoke of *painful hypertrophy af the breasts and its relief by mastopexy* before the Surgical Society, June 30th. The patient to whose case he referred was a very stout woman, whose breasts reached her groins, preventing her from wearing corsets and from doing work, and giving her in addition a great deal of pain. An elliptical incision was made along the inferior surface of each breast, and a large portion of skin and fat removed. The glands were sutured to the fascia of the greater pectoral muscles, and the wounds closed by sutures. Union was prompt, and the deformity, with its accompanying pain and disability, was permanently relieved.

In speaking of *fractures of the patella*, POIRIER said that the dimensions of the patella vary much according to the age of the individual, as successive layers of osseus tissue are added peripherally with advance in years, the central part of the bone meanwhile becoming very porous. The practical lesson from this observation is that the treatment of fractures of the patella by the open method is not alike in all cases, but that more solid patellæ are fitted for suture, while "cooperage" is the best for more porous bones.

BERGER mentioned *a case of primary melanotic sarcoma of a gland* in the subhyoid region. The most careful search failed to reveal any other source of the trouble.

MARCHAND mentioned a similar case in which the sarcoma was of the inguinal glands, and another in which the glands of the axilla alone were affected.

At the Medical Society of the Hospitals, July 2d, GALLIARD related the case of a man, aged forty-three years, who suffered from pleurisy, at first serofibrinous and then purulent. A pleurotomy was performed in the eighth intercostal space, and a drain left in position. Fifteen days later the drain was removed, and cicatrization rapidly followed. Some time later it was observed that with each expiration there appeared in the scar a soft tumor about the size of a nut, which was non-pulsile and non-crepitant and easily reducible. Under the influence of a compress and bandage, worn for some months, the little hernia of the lung permanently disappeared.

Vienna.

REPORT OF THE GERMAN COMMISSION UPON THE PLAGUE AT BOMBAY—SUPRARENAL EXTRACT USED LOCALLY TO CONTROL HEMORRHAGE.

AT the session of the Imperio-Royal Society, May 28th, ALBRECHT presented a *report of the German commission upon the Bombay plague.* The commonest form of the disease is the *septic-hemorrhagic* one. The buboes occur oftenest in the groins, and next in the axillæ and the neck, involving sometimes a single gland, sometimes a whole group. On cut section a gland shows a number of red and yellow areas, and these infarcts are often con-

tinued into the surrounding tissues. If death does not ensue, there usually results suppuration and breaking down of the skin with discharge of hemorrhagic and necrotic masses. The whole process is accompanied by marked edema, and often proceeds with great rapidity. In a few hours from the time of outbreak, vomiting, fever, etc., and infiltration of the tongue, pharynx, and gullet, are common.

In the vicinity of the original bubo, there frequently appear bullæ filled with clear or cloudy serum, and proceeding to carbuncle formation. These were supposed to be the result of lymphangitis, but although this cannot be proved, the fact that one of the physicians of the investigating party developed a bulla as the result of a scratch received at an autopsy supports this theory. This bulla became hemorrhagic, and its contents contained a pure culture of the pest bacillus.

Besides the buboes, the general lymph system shows infection, the throat, as already referred to, often presenting the appearance of diphtheria, while the spleen is so filled with the bacteria that they form a considerable part of its swelling.

Hemorrhages into the pleura and other serous membranes are the rule. They were also not wanting in the muscles of the neck, breast and abdomen.

Another form of the disease, the *septic-pyemic*, develops in those cases in which the poison has had time to produce embolic masses in the internal organs. These are especially noticeable in the lungs and liver and to a less extent in the kidney.

The third form is a *primary plague pneumonia*, and it is by this form that English doctors and nurses are chiefly attacked. The pneumonia occurs in patches, and these are indistinguishable from the pneumonic areas which occur in the second form. Cases of this type run a fearfully rapid course and quickly lead to death.

The infection reaches the system in most cases through the skin, but the numberless scratches on the bare legs and arms of the Hindus make it difficult to determine in most instances its exact point of entrance. Whether the stings of insects are responsible for the infection in any case could not be ascertained, though this is the popular belief among the natives. From the occurrence of primary plague pneumonias, it appears that infection by inhalation is possible, and doubtless infection sometimes takes place through the tonsils.

The plague bacillus discovered independently by Kitasato and Koch is easily isolated and may often be obtained in pure culture from the blood. The pus is usually sterile, or contains other germs, but not the plague bacillus. Animals artificially infected with the bacillus, quickly die with all the symptoms of the disease, but it does not occur spontaneously in any animal except the rat. The members of the commission did not see any benefit result from the use of a plague-serum. So far from being surprised at the high mortality of the plague, they expressed their wonder that more did not die of it, so bad are the conditions of life in which the natives are placed.

At the session of the Medical Club, June 16th, KONIGSTEIN said that the *extract of the suprarenal capsules is the only one of the animal extracts which has been used locally*. Dropped into the eye, it is said to produce a profound anemia. Taking a suggestion from this, it has been used to control hemorrhage, but its working in this direction leaves much to be desired, as it dilates the larger vessels, while contracting the smaller ones and capillaries.

SOCIETY PROCEEDINGS.

AMERICAN CLIMATOLOGICAL ASSOCIATION.

Fourteenth Annual Meeting, Held at Washington, D. C., May 4, 5, and 6, 1897.

DR. ROBERT H. BABCOCK of Chicago presented a paper, entitled

A BRIEF CONSIDERATION OF SOME POINTS IN THE MANAGEMENT OF CONSUMPTION,

for the purpose of drawing forth discussion by the members of the Association. He inquired first whether the slight elevation of temperature in the early and unmixed forms of the disease is inflammatory in origin, as held by Jaccoud, or whether it is an expression of infection by the bacillus tuberculosis. For diagnostic purposes he attaches no importance to the occurrence of afternoon temperatures below 100° F., which should be regarded as subfebrile, fever not being present until the temperature reaches 101.3° F. For temperature below this point, and even when fever is moderate, *i.e.*, between this point and 103° F., he orders absolute rest in the open air when possible, regulates the diet, and promotes free expectoration. Solid food is only allowed at such times during the day as the temperature is subfebrile or normal—generally in the morning, of course. Liquid diet, such as milk properly diluted with some alkalin water, is allowed when the fever is present. Patients are instructed how to cough intelligently and efficiently, and if the sputum is tenacious terpin hydrate or some other equally efficient and harmless expectorant is administered; in the belief that at this stage febrile temperature is due largely to absorption and consequent sepsis. Dilute hydrochloric acid, pepsin, pancreatin, taka-diastase, and the like are administered to aid the enfeebled digestion. If such simple measures do not suffice, careful sponging is resorted to whenever well borne. He administers as little medicine as possible, apart from strychnin and the carbonates of guaiacol and creosote, relying chiefly on fresh air, rest, and nourishment. Whenever drugs are ordered they are usually in response to troublesome symptoms, such as cough and sweating, anorexia, diarrhea, and the like.

The second symptom discussed by the speaker was night-sweats. They are a phenomenon of sepsis, and the ideal treatment would be the removal of the cause. He gives picrotoxin, $\frac{1}{60}$ of a grain, in the late afternoon, and a like dose in the evening, so as to obtain the action of the remedy before the expected sweat occurs. He never uses atropin for this purpose, but sometimes orders camphoric acid in 15-grain doses, three times daily. The picrotoxin rarely fails.

Diarrhea is another symptom which, in advanced cases,

is often very obstinate, and requires skilful handling. He rarely prescribes opium, preferring intestinal antiseptics, as dermatol and other preparations, benzonaphthol, and salophen; but when he does resort to an anodyne he gives phosphate of codein. A tuberculous physician, now in Texas, related that after having had obstinate diarrhea for months while in Mexico, he obtained prompt and lasting relief from enteric pills of creosote. As this treatment was coincident with his removal to a somewhat lower altitude in Arizona, the query arises, How much is to be attributed to the creosote, and how much to the change of location?

The next query was, Should we send our patients to Colorado and New Mexico if the larynx is infiltrated, but not yet ulcerated?

Finally, what opinion should one give to a patient who has regained his health at a high altitude and then desires to return for permanent residence to his old home at the sea-level? The speaker has always regarded such a course unwise, if not actually unsafe, even in cases of incipient and circumscribed lesions. Aside from the fact that the climate of the patient's former home is less dry, equable, sunshiny, and pure, it has seemed a dangerous experiment, because the apices and borders of the lungs expanded under low atmospheric pressure are again likely to fall into comparative disuse at a low altitude. Will respiratory gymnastics prevent this? Is it safe for a patient, having nearly or quite regained health in Colorado or New Mexico, to remove permanently to even desirable localities in Southern California, Texas, or other comparatively salubrious climates of lower altitude? Is it necessary to impress patients who have not pronounced tubercular inheritance with the importance of changing residence permanently?

DISCUSSION.

DR. V. Y. BOWDITCH of Boston: In regard to what Dr. Babcock has said about it not being necessary to force down the temperature of phthisical patients who do not complain of fever, I can heartily agree with him. Attend to the general condition of the patient, and leave the fever alone unless it causes great discomfort. As to the return to a lower altitude after a residence in a higher one, where health has been regained, my early teachings and my own experience have made me feel it is an experiment attended by much risk. We know of many exceptions, doubtless, but my usual advice to a phthisical patient is to remain in or near the place where he regained his health.

DR. HANCE of Lakewood: As to the question of sending laryngeal patients away, I think that it depends upon the degree of laryngeal invasion. If they are in the last stage of phthisis, they might as well stay at home. I have found that Tully tablets, in combination with bismuth or salol, are very beneficial in the diarrhea of such patients. Instead of using morphin in the last stages of phthisis, codein will often carry the patient on for two or three weeks, or even months, after which we must fall back on morphin. There is one preparation of service in the early stages of the disease. Dr. Quinby spoke of it four years ago. It is aquazone, which improves the condition of the stomach. The last report of the sanatorium at Saranac Lake refers to the use of tuberculin. There were many patients there to whom it was administered. During the time it has been in use at the sanatorium there have been twenty-four patients discharged "apparently cured." Their after-history has been followed, and it is reported that twenty-two are now well, that one died of chronic alcoholism, and one died in an insane asylum.

DR. NEWTON of Montclair: I should like to know why Dr. Babcock objects to the use of atropin to check night-sweats of phthisis. I have generally obtained good results from its use. I am now treating an advanced case of phthisis in which atropin in reasonable doses having apparently lost its power, I resorted to the use of agaricin, and afterward to camphoric acid. Neither of these drugs proving to be satisfactory, I tried sulphonal in 7½-grain doses every six or eight hours, and was much pleased with the result.

DR. HARE of Philadelphia: The results of the experiments of those who have done laboratory work prove that guinea-pigs confined in laboratories are naturally subject to tuberculosis. The great objection to the use of atropin in the treatment of night-sweats is the fact that it disorders the digestion by stopping the secretion of gastric juice. I have for a number of years used camphoric acid with very great satisfaction. It should be given in the dose of at least 20 grains three or four hours before the usual time of the sweat, so that it may be absorbed from the stomach in time to exert its physiologic action. It dissolves very slowly, and is best given in a cachet. I have recently been engaged in studying the rapidity of absorption of various drugs, and I believe that the condition of the gastro-intestinal mucous membrane in relation to the absorption of remedies is not sufficiently studied. Briefly, I may state that if a small quantity of some gastric stimulant, such as capsicum, is added to the camphoric acid in the capsule, it will aid very materially in the absorption of this antisudorific remedy.

DR. HANCE: My experience has not been such as Dr. Hare describes. I have used at least 200 guinea-pigs in experimental work. By far the largest proportion of these were found free from any tuberculous infection after they had been subjected to inoculation, and only those were tuberculous in which we had reason to suspect the presence of the tubercle bacilli previous to inoculation. If guinea-pigs are found tuberculous without any inoculation, they have either been inoculated by reason of bad breeding-quarters or lack of care in looking after them in the laboratories where the experiments are performed.

DR. SOLLY of Colorado Springs: Some physicians think that because the patient worries about the night-sweats and feels that the doctor should be giving him something to stop them, they should fall in with the patient's mood. I would let the night-sweats take care of themselves and devote myself to building up the system. It is generally a question of food. The intelligent use of whisky is to be commended, but the patient should not be allowed to drink all the whisky he can.

Concerning tuberculous laryngitis, I am convinced that the delusion ought to be put to one side that high altitudes exert an unfavorable effect. If altitude is good for

tuberculosis, it will be good for the other complaint also, but not otherwise. Another point is that tuberculous laryngitis in the ulcerative stage should be treated locally.

DR. W. H. DALY of Pittsburg: In the belief that we would all like to hear of the experience of others upon this interesting subject, I would state that for three years I have been administering doses of ½ to 1 drop of pure carbolic acid, with 1 to 2 drops of compound liquor of iodin in water, one-half hour before meals, followed by as much hot water as the patient can drink, with very beneficial effects; in fact, in some cases I have succeeded in arresting the progress of the disease. I found some of the more fickle-minded patients objected to taking this solution. I therefore had some tablets made representing the same, or supposed to represent the same drugs and dose, but equally good results did not follow their use. I also keep the air of the bed-chamber saturated with iodoform, and find that patients soon become accustomed to the odor. If I were to be denied all remedies but one for the abatement of cough, I should choose laudanum in the minimum adequate dose. Another valuable remedy for the cough of phthisis is sulphate of codein in 1-grain doses at bedtime; it will carry the patient through the night without cough, and disturb the secretion but slightly.

DR. KNIGHT of Boston: I think that it is important to treat easily accessible laryngeal ulcerations locally. The present method is by curetting and the application of lactic acid. This will often prove very satisfactory, and should be tried, especially when the ulceration seems superficial and there is no perichondritis. I use iodoform internally, 1 to 3 grains of this taking the place of creosote. I have found that patients will tolerate from 3 to 6 grains of it a day. I would like to ask Dr. Daly what effect he wished to obtain from the use of iodoform, and whether he used it for its antiseptic effect.

DR. DALY: In my opinion, iodoform is the best and safest germicide which can be used in the air-passages. I am in the habit of cleansing, as far as I can, the gray mass from the ulcers of laryngeal phthisis and then covering the surface with iodoform powder, and I instruct the nurse or attendant to repeat this often, and always after free expectoration by the patient. I endeavor to bring the patient as completely and quickly as possible under the influence of iodoform, and maintain the influence, and if this can be done, and foolish objections of friends as to the odor overcome, an arrest of the disease and, in many instances, a cure may be expected. I have had some phthisical patients that lived six, eight, and ten years, apparently well, and died from other causes. I have also given iodoform internally, in from 1- to 5-grain doses, as an antiseptic and alterative in other diseases, especially those of the digestive organs.

DR. BABCOCK: Concerning the danger of allowing tuberculous patients to return to their old homes, I may say that this question has troubled me more than any other. Dr. Hare's objection to the use of atropin seems to me a sufficient one, and its unpleasant physiologic effects are enough to influence us to try some other remedy. I cannot pass by the remarks of Dr. Daly concerning the use of laudanum. Of course, we are sometimes compelled to use opium in cases of consumption, but I think its use should be put off as long as is possible, and that the codein preparations should be employed instead, since they are devoid of the unpleasant effects of other opiates.

THERAPEUTIC HINTS.

For Eczema of the Genital Organs.—In this disease, so remarkable for the severity of the subjective symptoms, for its tendency to persistence, recrudescence, and nocturnal exacerbation, the following formulæ are highly recommended by Finny of Dublin, to allay irritation:

℞ Lin. calcis . . . . . f ℥ iv
Ext. belladonnæ . . . . . gr. xii
Zinci oxidi . . . . . ʒ ii
Glycerini . . . . . f ℥ ii
Aq. calcis . . . . . f ℥ iv.

M. Sig. Lotion, to be applied at night after bathing the parts in hot water.

℞ Lin. calcis . . . . . f ℥ iv
Ac. hydrocyan. dil. . . . . f ʒ i
Sig. plumbi subacetat. . . . f ʒ ii
Glycerini . . . . . f ʒ ii
Aq. rosæ, q.s. ad. . . . . ℥ viii.

M. Sig. Cream, for application on strips of old linen.

For Exophthalmic Goiter.—HUTCHINSON advocates the use of potassium bromid, in 20-grain doses, three times a day. The salt should be taken an hour or two after meals in half a tumblerful of water.

For Galactorrhea.—

℞ Atropinæ sulph. . . . . gr. iv
Aquæ rosæ . . . . . ℥ i.

M. Sig. Apply on lint or cotton over the breast and remove when the throat becomes dry.—*Bartholow.*

For Fetor of the Breath, due to carious teeth.

℞ Sodii biboratis . . . . . gr. xv
Thymol . . . . . gr. vii
Aq. dest. . . . . ʒ lxxv.

M. Sig. Mouth-wash.

For Acute Gout.—

℞ Ext. colchici acetici, Ext. aloes, Pulv. ipecac., Hydrarg. chlor. mitis } aa . . gr. i
Ext. nucis vomicæ . . . gr. ¼.

M. Ft. pil. No. i. Sig. One such pill to be taken every four hours until purgation ensues.—*Loomis.*

For Gonorrhea in Females.—

℞ Zinci sulphatis . . . . . ℥ i
Aluminis . . . . . ʒ iii.

M. Sig. Dissolve one teaspoonful of the powder in one pint of warm water and use as an injection, three times daily.—*Ringer.*

Another excellent mixture for the same purpose is the following:

℞ Creolin . . . . . *m.* xxx
Ext. hydrast. Canad. fluid. . . ℥ iiss.

M. Sig. Two teaspoonfuls in a pint of warm water, to be used an injection, two or three times daily.—*Lutaud.*